ARCHIVES OF OPHTHALMOLOGY.

THE BEST METHODS FOR THE DIAGNOSIS AND TREATMENT OF OCULAR TUBERCULOSIS.[1]

BY DR. GEORGE S. DERBY, BOSTON.

THE purpose of my paper is to discuss briefly from personal experience the methods we are using for the diagnosis and treatment of ocular tuberculosis, and as the subject is such a broad one, I propose to confine my remarks to tuberculosis of the anterior part of the eyeball.

In the dark ages of ocular tuberculosis the disease was rare, and it was easy to make the diagnosis by the clinical appearance and by the pathological examination which usually followed. The introduction of the subcutaneous tuberculin test widened our diagnostic field and proved that the clinical appearances of the disease were not so easily recognized as had hitherto been believed. The increasing interest in general tuberculosis led to the introduction of the new local tuberculin tests and the diagnosis again appeared easy. Experience soon showed, however, that a very considerable proportion of all people healthy or otherwise reacted to these new tests, and to the older subcutaneous test. As a result to-day we are again in the negative phase.

The scientific treatment of any disease rests on a scientific diagnosis and there is little doubt but that in many instances, judging from current ophthalmological literature, our diagnosis can be improved. This is, perhaps, due to the fact

[1] Read by invitation before the Section on Ophthalmology, New York Academy of Medicine, January 6, 1910.

that in the past, and even now, many obscure ocular conditions baffle our most earnest efforts. We have been forced to rely on the history of the case and on the story of previous vague "rheumatic" pains; or of a past venereal infection. We are now acquiring various scientific tests which aid us enormously in our diagnosis, such as the tuberculin test, the Wassermann reaction, and others of less importance. In a recent case of iritis it was possible to determine accurately the infecting germ in the eye by the local reaction which followed the injection of antigonococcus serum.

The first question which comes up is: What evidence must we have in order to make a definite diagnosis of tuberculosis of the eye?

We know of but two by which a definite diagnosis may be made.

First, by the microscope and inoculation; and this is available practically only in the cases of conjunctival tuberculosis. Out of the last seventy or eighty cases which I have seen, it was possible to make the diagnosis only twice in this manner; one of these showed a conjunctival vegetation, and the second presented two large reddish growths resembling granulation tissue in appearance, situated half on the sclera and half on the cornea on the nasal and temporal sides of the same eye. The microscopic picture suggested lupus, and tubercle bacilli were found in the sections.

The second method of making a definite diagnosis is the production of a local reaction in the eye following a subcutaneous injection of tuberculin, and this method has its limitations also. It may mean a week's sojourn in a hospital; the patient is often frightened by a smart general or local reaction, and may refuse to have further injections for therapeutic purposes, or he may even refuse further treatment.[1] A positive test with its unpleasant symptoms has at times a profoundly depressing effect on the patient. A local reaction in the eye may retard considerably the progress of the patient. But most important of all is the fact that in a very considerable proportion of cases the desired local reaction does not

[1] One of the very few cases that we lost this past year refused treatment for this very reason.

occur, while the general reaction obtained is little more valuable to us as evidence than is a positive cutaneous reaction. I must confess that I always withhold the subcutaneous test until all other methods have been exhausted. If they have been exhausted, then I believe it should, where possible, always be performed. Of the less conclusive tests for diagnosis of tuberculosis of the eye, the Pirquet is valuable for the negative information it furnishes. Our rule has been to exclude tuberculosis on the evidence of two negative cutaneous reactions performed with 100% old tuberculin. In a small percentage of adults, however, we have to admit that this test is uncertain. I can call to mind two very poorly nourished patients with ocular lesions which very careful investigation convinced us were tuberculous, and yet the cutaneous test was twice negative in each instance. One of these patients had an extensive ulceration of the larynx, marked signs at both apices, and a negative Wassermann reaction.

The clinical picture is, of course, of great importance in the diagnosis. In many instances the disease may be recognized at a glance, while in other cases there is absolutely nothing to distinguish it from other conditions. In the conjunctiva, leaving out of consideration the ordinary phlyctenular type of the disease, we may find the vegetations and ulcers which have so long been recognized. These are nearly always situated on the palpebral conjunctiva. In addition we may have the well-known large phlyctenule usually seen in adults, and situated at a little distance from the limbus. This may disappear entirely or be gradually replaced by a scleritic nodule. In addition we have the little grayish-yellow raised structures occurring frequently in scleritis and described in the past by many writers, but first brought into definite connection with tuberculosis by Verhoeff who regarded them as pathognomonic of tuberculous scleritis. Personally, I am of the opinion that a large proportion of all scleritis is tuberculous.

Tuberculosis of the cornea is protean in its aspects, and as far as I know we have no satisfactory and authoritative description of the forms it may assume. Certain appearances are characteristic, such as the rounded yellow or gray nodules occurring singly or in groups, situated deep in the cornea and

vascularized at some period of development. The sclerosing keratitis leaving its characteristic scars behind is also common. In my experience the classical interstitial keratitis is seldom of tuberculous origin; the tuberculous type of the disease presents varied and atypical features. One may note numerous other forms such as the white or yellow tongue-like processes projecting from the limbus into the cornea, an appearance regarded as characteristic by Posey. Complicating a scleritis I have several times seen a corneal infiltration develop, not a direct extension as is common from the scleritic patch, but leaving a zone of clear cornea between. A feature which seems to be very typical is the nodule developing in the iris angle starting at the lowest part of the cornea and extending upward, leaving a very characteristic triangular scar with its base downward. This suggests an infection from bacilli which have settled to the bottom of the anterior chamber.[1]

Tuberculous iritis usually starts like an ordinary iritis and only later may nodules develop. These may be situated at any point in the membrane.

What is very noticeable about all these cases is the frequency with which the clinical picture changes from day to day and week to week. The disease jumps from the sclera to the cornea, cornea to iris, iris to sclera, or *vice versa*. In very severe cases all three membranes are likely to be affected at some period of the disease. It has seemed to me that on the whole corneal processes show more tendency to remain localized than do those in the sclera or iris.

To sum up—in certain forms of ocular tuberculosis the clinical appearance is of great assistance in making the diagnosis, while in other forms it may be of no help whatsoever.

The history and general examination of the patient often furnish valuable aids to diagnosis and should be very carefully gone into. Of 26 cases reported last year by Dr. Ayer and myself, 19.2% gave a bad family history, while out of 34 cases from which I have records on this point this year, 20.5% gave a bad family history.

Furthermore, I believe the previous eye history to be of

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[1] Dr. Verhoeff has suggested to me that Schlemm's canal forms the starting point for these nodules.

considerable importance. Tuberculosis of the eye is essentially a recurring disease, and I believe that if we question these patients carefully we shall usually get a history of a previous inflammation. In the series this year we got such a history in 58% of cases. Most of these gave a history of inflammation in childhood—probably a phlyctenular process. If you will permit a digression here. The fact that the deep tuberculous infections of the eye are often preceded by a phlyctenular process is additional evidence in favor of the tuberculous origin of that disease. If accident and blenorrhœa neonatorum can be ruled out, I believe that the presence of corneal scars in children usually points toward a previous tuberculous infection. In this connection it would be interesting to learn in what proportion of cases with tuberculosis of lungs, glands, joints, etc., corneal scars occur or a history of an ocular inflammation in childhood can be obtained. I do not know of any statistics on this point. During the past autumn I examined 250 patients at the Massachusetts State Sanatorium with this in mind and I found only two positive cases out of the number. Naturally such a small series is of no value.

Although various writers state that comparatively few cases of ocular tuberculosis present physical signs outside the eye, my experience has been the reverse. In the series of cases presenting deep tuberculous lesions of the eye, already referred to, 69% gave some suspicious sign of tuberculosis elsewhere. In the similar series of this year, out of 34 cases 18 showed a suspicious lesion (53%), usually situated in the lungs or in the glands and in most instances quiescent.

A majority of our cases tend to run a slightly increased temperature.

The diagnosis then of ocular tuberculosis can seldom be made on any one point alone but must be built up from all the facts in our possession. The exclusion of all other probable causes is not sufficient to make us regard the case as surely tuberculous, though it may be enough to warrant us in trying tuberculin injections. A positive Wassermann reaction may often prevent us from making a serious blunder. When all other means have failed we should try to obtain a local reaction from the subcutaneous injection of tuberculin.

TREATMENT.

In the beginning of my experience with ocular tuberculosis, we had no satisfactory way in Boston of handling these cases. They demanded much more time and care than did the other clinic cases and we had no means of reaching them in their homes. Some three years ago we began referring them to the tuberculosis classes of the Social Service Department of the Massachusetts General Hospital for general treatment and supervision in the homes. This was a great improvement but still left something to be desired for obvious reasons. One year ago through the benevolence of certain charitable persons a tuberculosis class was established at the Massachusetts Charitable Eye and Ear Infirmary, and as I believe that a class of this kind furnishes the best method of handling these cases, I want to tell you something of our system.

Our personnel consists of an ophthalmologist, an internist, a social worker, and a nurse. Patients are referred to us from the other clinics, and if the diagnosis is conclusive we accept them and enroll them as members. On one card the eye record is made, on another the medical record, and on a third is the social record of the case, home conditions, financial resources, etc. The enrolment of a patient does not always mean that we will treat her in the class as an out-patient. The home conditions of some of our patients are such that they cannot be treated successfully there. Some may be referred to a sanatorium while others may be in such a critical condition that hospital treatment and observation is indispensable. We discuss our cases from week to week and determine what in our judgment is best for each one. Having decided, it becomes the duty of the social service worker, that wonderful invention of recent years, to see that our advice is carried out. For the tuberculosis class the social service worker is an indispensable adjunct. She is the keystone of the whole structure. She it is who picks up the thousand loose threads and makes the doctor's work efficient. She reports as to how faithfully each patient is carrying out the treatment, and if a patient must be referred to some other institution it is she who procures the funds and makes all the arrangements. We have one stated weekly meeting of

the class at which all members under active treatment report. They are weighed, temperatures and pulse taken, and then they report in turn to me and to Dr. Eastman, our internist; their records are inspected and their condition noted. If they are getting tuberculin they then receive their injection and go home. Besides this one stated meeting a week, certain cases come once or twice in addition if they need more frequent observation or more than one dose of tuberculin a week. It so happens that a number of our patients live at some distance from Boston, and cannot come more than once a week. Our patients keep a record at home during the week.

It seems logical, where possible, to treat these patients in their homes, for when the cure is completed there is not the sudden change of habit and environment necessary to the patient who returns home from the sanatorium.

During active ocular inflammation or increased temperature we insist on complete rest. Patients are instructed as to diet and fresh air and are shown personally how they may rest out of doors We impress our patients with the fact that a cure is likely to be a question of months, but that they will eventually get well.

To my mind this is the most uncertain disease which we treat. I never feel sure as to how a patient is going to progress and as to how much time will be necessary for a cure, and I do not believe it is possible to estimate with any certainty how much damage will be done to an eye. In our experience there is no ratio between the severity of the disease and the general condition of the patient. In some instances it appears that the more evident are the signs of a pre-existent tuberculosis elsewhere in the body, the milder will be the type of ocular disease, and we have also noted that the most severe forms of ocular disease often occur in patients of splendid development and good general condition. We are inclined to look askance at a tuberculous eye occurring in a person of excellent physique. Our poorly nourished tuberculous-looking patients do at least as well as do the stout ones, perhaps because they have already a greater degree of immunity to the disease.

We have handled some fifty cases during the past year and a number of others in preceding years and have never yet

had to resort to removal of the eye. At about the beginning of last year we took into the class two patients of rather similar appearance and with eyes showing about the same lesions. Both were healthy, robust women of fine physique, one eye only was affected in each, and showed an inflammation of great severity, numerous yellow nodules in the cornea, irides, and scleræ, very great ciliary injection and blocked pupils. Great pain and tenderness. Light perception and projection good. Both had been under treatment outside, one for sixteen months and one for nine months; the eyes had grown steadily worse. Both had been advised by competent men to have the eyes enucleated. We had just completed the organization of our class and we took both patients to see what we could do with them, without any great expectations. Under hygiene and tuberculin the eye of one patient quieted in three months and has remained quiet during the past eight months. The other patient quieted in five months and has had no recurrence now for seven months. Last year I reported the history of a man who on account of repeated attacks of ocular inflammation of tuberculous origin had only been able to work five months out of thirty-six. After ten weeks' class treatment and seven weeks in the state sanatorium he was enabled to go back to work and now fifteen months later he has not missed a day since he returned. These cases are mentioned to show the favorable results which may be accomplished, but we must not forget that there is the other side. We have still under treatment a patient who came to us twenty-six months ago with a simple iritis in each eye; he has since had involvement of the sclera and cornea and nodules in his iris. One eye is now quiet, but the other is still inflamed in spite of everything we have been able to do. He has been three months in a sanatorium, has had numerous tuberculin injections. His home conditions are excellent.

Some of these patients relapse in the most unaccountable manner. For example, a young man with sclero-keratitis whose home conditions were so unfavorable that we sent him to a sanatorium. At the end of five months he had completely recovered, was in splendid general condition, and returned to resume work. Two days after his return the hitherto healthy eye developed a severe scleritis.

A private patient with an atypical interstitial keratitis recovered under strict hygiene and tuberculin at the end of six months. It being summer he decided to take a two weeks' holiday on the Maine coast before beginning work. He was in the best physical condition that he had known for years. About a week after his arrival in Maine he came down with some sort of an acute infection with a temperature of 104°, and mild gastro-intestinal symptoms, and his healthy eye developed an interstitial keratitis similar to the other, but which ran a milder course.

We have advised sanatorium treatment for certain of our cases because they could not get proper care at home. We have had considerable difficulty in knowing how best to dispose of some of our patients. There is a crying need for a small ward in each eye hospital for those cases who do not get proper care at home. In our experience they will not do well under the kind of hospital treatment which we can give them at present—where they get insufficient fresh air, and food not suited to their needs. They may get well, but the disease is very apt to recur shortly. Yet in many cases the disease at certain stages is so acute that the eye should be under constant observation. Our sanatoria are not fitted for eye cases, and they are usually too far away to allow us to keep in close touch with the patient. Therefore we prefer keeping the patients at home when possible.

We use tuberculin on nearly all of our cases; we give it in the upper arm for convenience and watch the temperature carefully. We aim to give as large a dose as the patient will stand without any sign of a reaction, general or local. (Out of 536 injections given in our class during the past year we have had only 8 general reactions, 2 of which were very slight, and 7 local reactions in the arm.) We use a bouillon filtrate obtained from the Saranac Laboratory which seems to be very toxic. We begin with $\frac{1}{10.000}$ of a milligramme (which equals about $\frac{1}{1000}$ of B.E.), and work up with reasonable speed, seldom going above one milligramme.

We avoid giving tuberculin at the menstrual period, and we look for and usually find a slight flare-up in the disease at that time. We believe in continuing tuberculin for some time after the ocular process is well.

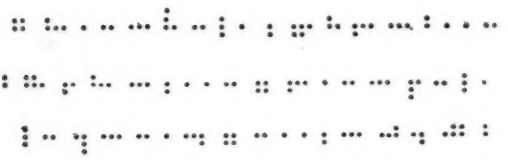
There is one point which I should like to emphasize and that is, the faithfulness with which patients follow out our directions and report for treatment. It is a constant inspiration to us to see them continuing with us month after month, confident that eventually they will be discharged well. Why they stand by us so faithfully I am quite unable to explain, but it seems to me that this is also a strong argument for this class method of handling ocular tuberculosis.

ILLUSTRATING DR. PERCY FRIDENBERG'S ARTICLE ON "A STIGMOMETRIC CARD TEST FOR ILLITERATES."

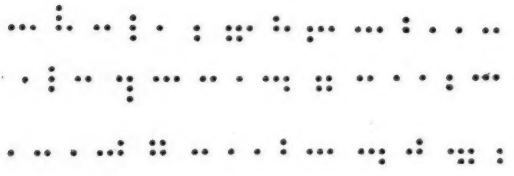
Fridenberg Stigmometric Test Type

A series of dots of definite and graduated size, in groups, to be counted at various reading distances as a test of vision and accommodation in illiterates.

JAEG. 1-4



JAEG. 5-8



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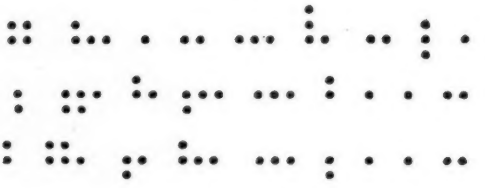


A STIGMOMETRIC CARD TEST FOR ILLITERATES.[1]

By Dr. PERCY FRIDENBERG, New York.

(With an illustration on Text-Plate IX. and folders.)

A READING card for those who cannot read may sound like a paradox. As a matter of fact, even for those who can read, type makes a bad test object, for various reasons, well known to ophthalmologists, which it is not necessary to detail here. I may merely cite the mechanical objections inherent in bad ink, paper, and type, the variations in legibility and distinctness—by no means identical terms—in different fonts, to say nothing of various objections from the standpoint of physiological or rather psychological optics. In the testing of accommodation range and the determination of the near point and far point, these objections are even more valid and of greater practical importance. If we use ordinary reading matter to determine the amplitude or the limits of focussing power, the patient, reading along as the page is brought closer and closer to the eye, will have taken in from two or three words to a line, ahead of what he is reading aloud, and will have partly memorized these words before they become blurred by extreme nearness. The near point will then be not at a fixed but at a varying distance from the eye, depending not only on the rate of speed at which the page is brought up to the eye, but on the rate at which the patient answers, his ability to memorize, and several other factors.

All these disadvantages can be avoided by using a small dot as a test object, and this has actually been done for measuring

[1] Presented before the Section on Ophthalmology, New York Academy of Medicine, February 20, 1910.

accommodation, by Duane, in his modification of Donders' scale. As far as I know, however, there is no illiterate test-type. We use numbers, which are open to the same objections, pretty nearly, as letters, and cannot be used at all for very young children. The advantages of the short-range test of vision, especially in children, are that it sometimes allows us to distinguish between errors of refraction and ocular disease as a cause of diminished vision, and frequently gives us an indication of the nature and even the degee of ametropia. The impairment of distant vision, alone, is a very insufficient clue. Again, the estimation of the range of accommodation and the detection of spasm or defective action in the ciliary muscle is of paramount importance in the young.

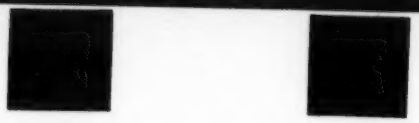
Accordingly, I have arranged a short-range test card with points or dots as the uniform test object. These points are arranged in lines like ordinary text, but in groups instead of more continuous succession. The size of these dots, and their intervals—just as important a detail—or spacing, correspond exactly to those of the various Jaeger test-types of the same number. The groups may be pointed out to very young children, who are then asked how many dots there are in this or that group. More advanced children or adults are allowed to read off the numbers of dots in the groups along a line. No explanation is necessary, as in the case of distance charts, such as "pot-hooks," pictures, and so on. This enables us to communicate, as in clinics, with patients who do not speak or understand English, and makes the test a universal one. An indication of astigmatism is given by the ease and accuracy shown in recognizing vertically and horizontally placed rows of dots, respectively. The type lines can be "read" backwards, as well as forwards; the book can be turned upside down, and also read straight down along the lines, *i.e.*, across the ends, thus giving four or more variations in the succession of points. Memorizing thus becoms a physical impossibility.

I have used the dots as the basis of a distance card, also constructed on the principle of the minimum separabile, to correspond with the Snellen types. The dots are squares whose sides subtend an angle of five minutes at the distance indicated, and each dot is separated from the nearest by an

FRIDENBERG MODIFICATION OF SNELLEN'S TEST TYPES

D = 50.

D = 30.



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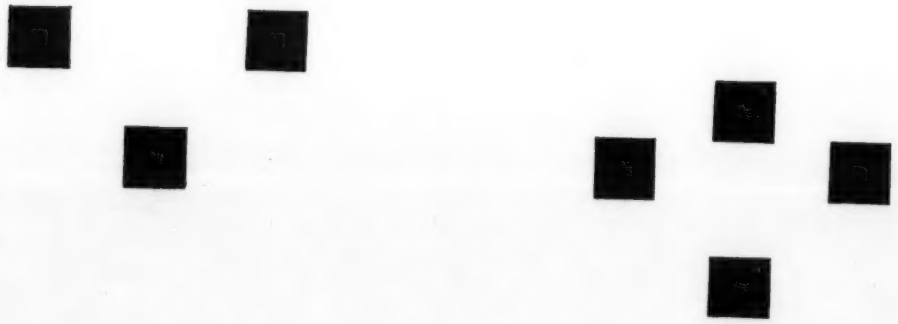

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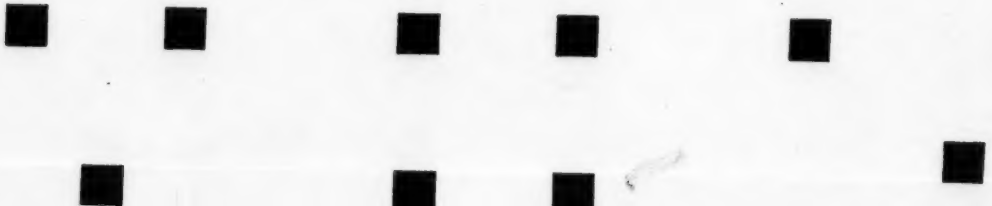
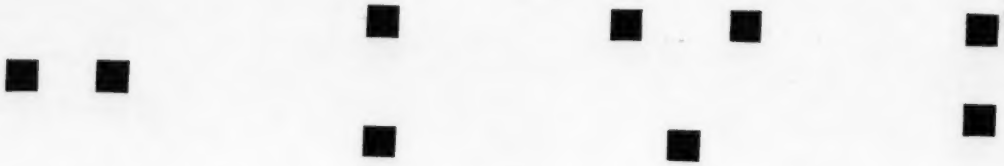


D=15.



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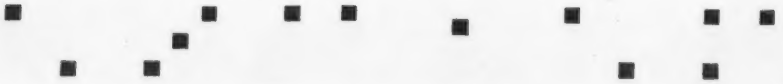
D=6



D=10.

D=6

D=5.

interval of at least five minutes of white. Here, too, the number and position of the dots can be varied by reversing the card, rendering it impossible to memorize as can so easily be done with the pot-hook chart. For testing large numbers of individuals, as in schools, recruiting offices, barracks, immigration stations, and the like, the simplicity, accuracy, and general applicability of the stigmometric or dot test-type should result in a great saving of time and, incidentally, of temper. In this chart square dots are used. The illiterate test cards in general use vary greatly in legibility and consequently in accuracy as a test of vision. One of the latest, which has as test objects a number of supposedly familiar objects, such as a horse, a hand, a house, a chair, and so on, is particularly badly constructed. The outlines of the figure to be read at fifty metres are drawn no thicker than those of the small figures on the 20–30 row. No matter how large the figure, it would be unrecognizable under these conditions. Again, the identification of the house, as such, depends on the recognition of door and window features which are much smaller, of a size corresponding to vision of less than half that for the other figures on the same line. This applies also to the full face of a man and the head of a cat, on the 20–40 line. Correctly constructed figures for such visual tests should be in heavy lines and recognizable by outline alone, as diamonds, hearts, squares, circles, a chair, and so on. The stigmometric charts and test-types are published by E. B. Meyrowitz, to whom, with Mr. Dayton, of the American Lithographic Company, I am indebted, respectively, for hearty co-operation and for expert aid in the mechanical incorporation of my ideas.

ETIOLOGY OF SCLERITIS, ITS TREATMENT AND RESULTS WITH TUBERCULIN.[1]

By Dr. ERVIN TÖRÖK, New York.

SCLERITIS is a well-known disease for every ophthalmologist, although not the most frequent yet not the rarest among external diseases of the eyeball. Uhthoff found it in his statistics 0.44%; Albrand (1) reports from Schöler's eye clinic out of 13,200 cases, 53, *i.e.*, 0.40%; Goldzieher (2) estimates it at 0.35%. I found in the eye clinic of the University at Budapest in 1905, 35 cases out of 11,380, *i.e.*, 0.30%, and in New York Ophthalmic and Aural Institute in 1907, 29 cases among 10,457 eye patients, *i.e.*, 0.28%.

The clinical picture of the disease is briefly as follows: In most of the cases we find in the anterior portion of the eyeball, between limbus and equator, a more or less circumscribed bluish-red or often violet nodule. It is generally somewhat prominent and projects above the level of the sclera, so that it forms a small elevation the size of a pepper seed. The conjunctiva is somewhat œdematous and swollen, and shows enlarged and tortuous conjunctival blood-vessels; the nodule is surrounded by a slight ciliary injection and the episcleral veins are also injected. The varied shade of color of this treble injection gives a peculiar bluish-reddish-violet color to the scleritis nodule. The swollen conjunctiva is movable above the sclera and upon pressure the redness disappears for a short time.

In a series of cases we do not find any nodules on the sclera, but it shows the characteristic bluish-violet injection

[1] Read before the Section on Ophthalmology, New York Academy of Medicine, January 6, 1910.

in a large area, which is not projecting but more evenly swollen, that is the so-called diffuse scleritis.

In the former form we occasionally see around the scleritic nodule some small yellowish elevations, similar to tubercles, which are mostly situated in the vicinity of the blood-vessels.

Vossius (3) excised some of the smaller nodules and upon examination found them to be composed of round and epithelioid cells but no giant cells, mostly situated around enlarged blood and lymph vessels; inoculations into rabbits showed negative results.

The subjective complaints of the patients vary; some complain of a mild degree of photophobia and epiphora, others of very severe pains in the eye and in the bony surroundings of the eyeball.

In the course of the disease we observe that pains eventually disappear first, then (usually in 4–6 weeks) the nodule and the injection, and at the place of the diseased sclera there remains a circumscribed grayish scar.

In a large majority of cases the disease is a chronic one, and prone to relapses. After a shorter or longer interval there appears in the vicinity of the previous nodule a fresh one, and the disease, always recurring in this way, usually lasts for several years.

In a great number of cases the course of the disease is not so simple. We observe the participation of other tissues of the eye; the most common is the involvement of the cornea producing an inflammation (the sclerosing keratitis of von Graefe) where we see the development of an infiltration in the adjacent parts of the cornea in the deep layers, which does not become absorbed, but causes a permanent, deep, bluish-white opaque spot.

Among the other complications we have to mention the cyclitis with deposits on the posterior surface of the cornea, posterior synechias, opacities of the vitreous, and often with increased tension. In these latter cases the vision is naturally very much impaired.

In the later course of the disease, owing to the fact that the diseased and cicatrized parts of the sclera lose their elasticity and capacity to withstand the intraocular pressure, we often see the development of distension of the sclera

either as distension of the whole anterior half of the eyeball (extasia bulbi anterior), or the bulging develops only in small circumscribed areas, in which case we get the various scleral staphylomata.

In the beginning this disease is mostly limited to one eye, but in its prolonged course it usually involves the other eye. Scleritis may occur in any age, but we find it chiefly in adults and mostly in women.

The etiology of scleritis is unknown. There is only one point on which all authors agree, and that is that scleritis is generally found in connection with some other disease of the system at large. Vossius says that scleritis is due to chronic rheumatism, gout, disturbances of menstruation, rarely to scrofulosis or lues. Fuchs (4) found in patients affected with scleritis very often signs of scrofulosis, tuberculosis, or hereditary lues. He says in women it might be due to menstrual disturbances. Michel (5) thinks that scleritis is very often the first and unique symptom of some general disease; according to him we find scleritis with the various forms of joint rheumatism, chiefly with the acute, subacute, and serous inflammations of the joints, and with those cases in which we have no fever. In many cases scleritis is due to true gout when the nodule on the sclera must be looked upon as a true gouty nodule, but in the majority of cases it is a syphilitic or tuberculous inflammation of the scleral tissue.

Alt (6) brings scleritis in connection with rheumatism, gout, syphilitis, and tuberculosis.

Swanzy (7) says that the most frequent causes are congenital syphilis, rheumatism, gout, goitre, and disturbances of menstruation.

According to Posey and Wright (8) rheumatism and gout are the most common causes, but in cases in which none of these diseases can be found in the previous history, they think the disease is due to disturbances of digestion.

Goldzieher divides the scleritis from the etiological point of view into two classes, one is evidently in connection with rheumatism and gout, the other with the scrofulous diathesis. The typical episcleritic nodule is mostly the result of chronic rheumatism.

Panas (9) mentions rheumatism, gout, disturbances of

menstruation, scrofulosis, and congenital lues as the most common causes of scleritis.

According to Wagenmann (10) the chief etiological factor is gout. An interesting article was published on this subject by Albrand (11) from Schöler's Clinic in 1895. He publishes 53 cases of scleritis and finds lues in 8 cases, *i.e.* 15.1%, articular rheumatism (acute, partly relapsing and chronic) in 10 cases, *i.e.* 18.9%, muscular rheumatism, either previous to or present at the time of scleritis in 18 cases, *i.e.* 33.9%. In one case there was a chronic gonorrhœa of the urethra, but without manifestation of participation of joints, and in another case he found malaria with trigeminus neuralgia and sciatica. Not one of his cases gave a history of gout. In 14 cases, *i.e.*, 26.6%, he could not find any cause in the previous history, even after observations extending for several months.

From the above we see that concerning the previous history and the cause of scleritis the authors agree on one point, this is, they all try to connect it with some disease of the body. First we find mentioned chronic rheumatism both joint and muscular, then gout, syphilis, both congenital and acquired, disturbances of menstruation and digestion, gonorrhœa, malaria, scrofulosis, and some mention as a subordinate and possible cause tuberculosis. In a great number of cases, however (Albrand 26.6%), we find nothing in the previous history which would indicate the causes of the scleral disease.

Pathological-anatomical examinations of eyes afflicted with scleritis give the same results. As mentioned above, Vossius, by examining scleritis nodules found them to be composed of round and epithelioid cells mostly situated around enlarged blood and lymph vessels.

Kostenitsch (12) examined a case of deep scleritis and found a round-cell infiltration at the site of the scleritic nodule. The infiltration was chiefly situated in the middle layers of the sclera and extended therefrom partly anteriorly in the cornea, partly posteriorly in the ciliary body and choroid.

Uhthoff (13) reports three cases in which he examined pieces of the conjunctiva and episclera obtained by operation. In each case he found dilated lymph spaces with round-cell infiltration without any characteristic features. Similar is

the result of the pathological-anatomical examination in Uhthoff's (14) fourth case.

Friedland (15), Schirmer (16), and Baumgarten (17) also found nothing but round-cell infiltration in cases of scleritis.

Schlodtmann (18) examined pathologically a case of scleritis which developed in a man 74 years of age, where the disease had involved the cornea and also the ciliary body. Similar to the reports of the above mentioned authors, he found round-cell infiltration in the sclera and episcleral tissue with dilated lymph spaces and numerous giant cells.

Zimmermann (19) found in a case of beginning scleritis tubercle bacilli, while Prochnov (20) found in another case only round-cell infiltration in the sclera, ciliary body, iris, and the anterior part of the choroid.

Finally Verhoeff (21) excised scleritic nodules, and the histological examination showed that "with the exception of the absence of caseation, the nodules had the structure of small tubercles."

All these published reports show that in cases of typical scleritis the pathological examination gave only the picture of an inflammation without any characteristic sign from which we could deduct the cause. The only exceptions are Zimmermann's case, in which he found tubercle bacilli, and Verhoeff's four cases in which the histological examination showed typical tuberculous structure.

When a few years ago I began to look for tuberculous diseases of the eye, and began treatment with tuberculin I found it remarkable that tuberculous eye diseases are more frequently met with than I thought after reading over the reports and statistics. The frequency impressed me mostly in cases of scleritis, especially of deep scleritis, namely that form which occurs together with the involvement of the cornea, iris, and ciliary body.

I thought it would not be an entirely uninteresting work to study clinically the action of tuberculin upon the scleritis, especially as neither the anamnestical data nor the pathological examination gives us a positive clue in searching for the etiological factor. All scleritis cases which I had the chance to observe in the last five years were submitted, as far as was possible, for diagnostic purposes to Koch's tuber-

culin, and for therapeutic purposes to T. R. I succeeded in collecting fifteen scleritis cases. Anticipating the end result of my researches I want to state that in my opinion tuberculosis is the main, and most probably the only, etiological factor.

We find several reports in the literature which speak in favor of this hypothesis, although we find plenty of them which positively speak against it. Vossius excludes tuberculosis because the inoculation of excised nodules into rabbits failed to develop tuberculosis in the animals. This statement, as we know, cannot be accepted, because, while positive results prove the presence of tuberculosis, negative results do not disprove it. There are many reports in the literature where unquestionable tuberculosis was inoculated with negative results. The cause of these failures may lie in the diminished virulence of the bacillus; it also may be due to the possibility that the small particle inoculated contained no bacilli, or also to the fact that the results greatly depend upon the ability of the animal itself or organ, into which the inoculation is made, to resist the disease.

Friedland, Schirmer, Baumgarten, and others positively exclude tuberculosis on account of the lack of the histological picture characteristic of tuberculosis and also the absence of tubercle bacilli. This statement can easily be disproved. Nowadays we know of tuberculosis that its pathological picture is variable. We can neither make nor exclude a diagnosis of tuberculosis depending entirely upon the microscopical picture. The presence of typical tubercles with giant cells, which have been for so long held characteristic in tuberculosis, do not always signify tuberculosis, and their lack does not exclude tuberculosis. It has been found that on the one hand tubercles may be absent in tissues which are positively of tuberculous origin, on the other hand giant cells in conjunction with epitheloid cells may be found in the form of islands in tissues positively not tuberculous. The same can be said about the absence of blood-vessels in the tuberculous structure and the caseation; as to the former we find according to Aschheim so many variations that it cannot be depended upon from the standpoint of differential diagnosis, as to the latter researches showed that it may also be found

in gummata, carcinomata, or sarcomata, etc., and its absence does not speak against tuberculosis.

Here I want to mention only a few of the many reports. Mitwalsky (22) reports a case of positively tuberculosis conjunctivitis in which the microscopical examination revealed neither giant cells nor tubercles, and Rhein (23) says of the same disease that there are cases in which neither the clinical appearance of the disease nor the histological structure of the follicles differs from real trachoma, and where in consequence the differential diagnosis can only be made by finding tubercle bacilli. Stock (24) in his recently published article reports cases in which he succeeded in developing various cases of eye tuberculosis in animals by injecting tubercle bacilli into the blood. The eyeballs were enucleated and anatomically examined. The microscope showed no characteristic histological picture of tuberculosis, on the contrary, it was so far from being characteristic that many men, prominent in pathological-anatomical examinations, to whom Stock showed the specimens, did not even think of tuberculosis, and only the presence of tubercle bacilli could convince them that the said histological picture is one of tuberculosis. The chief trouble is that the finding of tubercle bacilli in such cases is extremely difficult, and succeeds only in a small percentage of cases. Groenouw gathered together 133 cases of tuberculous iritis and in only 21 of these cases was the bacillus demonstrated. Plitt found the bacillus only in 4 cases out of 26 of tuberculosis of the lachrymal gland, even though the inoculation was successfully performed. Koch and Baumgarten explain this by saying that the bacilli take on spore formation, others like Reimer (25) believe that by preparing the specimen for examination and placing it into various substances like ether, alcohol, xylol, etc., the bacilli will lose certain substances, especially wax, from their bodies, thus also losing the property of being stained in the specific manner which makes them recognizable. Many taking the view that the bacilli are always found in great numbers in fresh tuberculous masses, while there are only a few in chronic cases, say that the reason so few cases are reported in which bacilli were demonstrated is because they were not carefully searched for. This latter explanation

is given in Stock's above mentioned article, and this seems to be proven in the case of Axenfeld and Peppmueller (26) in which there were no bacilli found in 120 serial sections of a tuberculous ulcer of the skin, but were found in the following sections, and bacilli were found only after the fiftieth section in an epibulbar tumor occurring on the same person.

Taking into consideration the other side of the question, we find several reports where scleritis was surely of tuberculous origin, and as we saw above, some authors mention it as an etiological factor though only as a subordinate, rare, and probable one. Zimmermann found tubercle bacilli in a scleritic nodule. Verhoeff claims that all scleritis cases are of tuberculous origin. He had 13 cases under observation and all reacted to Koch's old tuberculin. Under the subsequent tuberculin treatment some recovered, others showed a great improvement. As cited above, he also found that the nodules he excised showed typical tuberculous structure.

Very important data are found on this subject in Stock's article. Stock, for the purpose of studying the tuberculous diseases of the eye, injected live tubercle bacilli into the ear-vein of rabbits. The animals being infected in this way, developed various forms of eye tuberculosis, namely, cyclitis, iritis, choroiditis disseminata, scleritis, interstitial keratitis, tuberculosis of the conjunctiva, etc. Usually 10–14 days following the injection there appeared small yellowish-white nodules in the choroid, which usually disappeared in 8–14 days. Sometimes the animals developed in the choroid larger yellowish-white patches, with edges not sharply defined, which bulged slightly toward the vitreous. Some of these patches became entirely white, flat, the edges sharply defined, so that clinically the whole process may be looked upon as cured; others, however, slowly became deeper and correspondingly there developed on the sclera a violet-colored nodule around which the subconjunctival tissue became infiltrated and œdematous. In other words, there developed a typical scleritis, in many cases accompanied by a sclerosing keratitis. There were animals in which the scleritic nodule was the first and only symptom of the infection of the eye. Neither opacities in the vitreous nor patches in the choroid could be found clinically, and only the subsequent histo-

logical examination showed that the scleritis was a secondary one having its origin in a uveal tuberculosis. This course was found mostly in the animals in which the manifestations of infection after injection developed slowly, sometimes after 6 to 12 months or even later.

Examining the infected eyes histologically, he found that the nodules consist of small mononuclear lymphocytes and that most of them are situated in the chorio-capillaris layer of the choroid. If the animal has been alive for some time, and the nodules have disappeared clinically, in some cases the choroid has been found normal (*i.e.*, the process may heal without producing scar tissue); in others, however, he found scars in the choroid on the site of the nodules. In recent infections, nodules are found all over the choroid and in every layer, but in animals in which the infection occurred several months before the examination, the active nodules are always found in the anterior half of the eyeball and in the outermost layer of the choroid. These nodules always have a tendency to involve the sclera. He found cases in which the inner layers of the choroid were entirely normal, although the sclera and part of the cornea were transformed into tuberculous tissue. Clinically these cases showed a typical scleritis with sclerosing keratitis. He thinks that as in animals, so it is possible also in human beings for tuberculosis of the choroid or ciliary body to be present without any clinical symptoms, and we perceive the disease only when it penetrates through the sclera, and becomes visible in the clinical picture of a scleritis; on the other hand, he thinks that even if there are any changes in the choroid corresponding to the scleritic nodule, they are situated so far anteriorly that it is impossible to see them with the ophthalmoscope.

Treacher Collins (27), in his paper on intraocular tuberculosis, expresses the same idea in saying that the sclerotic not infrequently becomes invaded by tubercle of the uveal tract, and it is doubtful if it is ever the starting point of tuberculosis of the eye. He cites two cases in which tubercle of the ciliary body started in the lymph spaces external to the ciliary body, and adds that in like cases a nodule on the external surface of the eye simulating a patch of scleritis is an early clinical feature.

The following case which I observed a few months ago seems to correspond with the above hypothesis.

I. S., 23 years old, post-office clerk. Father and mother alive and healthy, so are two brothers and one sister. Had diphtheria and scarlet-fever when a child. Five years ago had a lesion on his right foot, and others on other parts of the body previous to that. Cured partly by operation, partly by medical treatment. Feels entirely well ever since. His physician who treated him says he had lupus of the skin. Eye trouble began 2½ years ago. *Status præsens;* eye white, deposits on the posterior surface of the cornea, iris grayish, post. synechiæ, lens transparent, many floating opacities in the vitreous. Ophthalmoscopically many white patches the size of the disk and even larger scattered over the choroid. Vision $\frac{20}{100}$. Very typical general and local reaction after the injection of 0.001 gr. T. V.

Was submitted to T. R., treatment on March 3, 1909. He improved steadily so that on March 26, 1909, his vision was $\frac{20}{30}$.

April 2d. In the superior-external quadrant of the eye between equator and limbus of cornea a nodule the size of a small pea appeared, yellowish-red in color, surrounded by some ciliary and episcleral injection and œdematous conjunctiva. He got four more injections and then interrupted the treatment for about 7–8 weeks. When he returned, eye much worse, slight ciliary injection, many posterior synechiæ, beginning cataract, opacities of vitreous so dense that fundus was entirely invisible. The nodule of the sclera larger. The T. R. treatment was resumed. The condition of the eye on September 27, 1909, was the following: eye white, many deposits on the posterior surface of the cornea, iris atrophic, posterior synechiæ, lens entirely opaque, fundus not visible Light perception and localization good. Nodule of sclerotic disappeared, but there is a small, grayish, conical bulging of the scleral tissue in its place.

In the course of five years I have collected 15 cases of scleritis. In all except one case I used for diagnostic purposes the subcutaneous T. V. injections according to the method of Enslin. Considering the fact that T. V. sometimes misleads, because in some instances we do not get the reaction in cases where tuberculosis is present, and in some other instances we get a reaction when there is no tuberculosis, I did not satisfy myself with the T. V. reaction,

but after the diagnostic injection I proceeded to the T. R. treatment, whenever the patient submitted himself to it, even when the diagnostic T. V. injection failed to produce a positive reaction.

In one case I omitted the tuberculin. This (Case 14) was a case of episcleritis without involvement of the cornea. The patient suffered from repeated attacks of articular rheumatism, and objected to tuberculin treatment and was submitted to salicylate of soda. The patient really recovered within four weeks under the anti-rheumatic treatment, but came back with a relapse four months after the previous apparent recovery.

The short histories of the cases are as follows:

CASE 1.—Male, 15 years old, family history negative. Tuberculosis of the skin of the right foot and infiltration of the apex of the right lung. Typical scleritis and sclerosing keratitis for the past two months on the right eye. He received 60 T. R. injections during which treatment not only the scleritis became perfectly well, the nodule on the sclera disappearing leaving no trace, but the tuberculosis of the skin was also healed with the aid of Paquelin cautery. In the beginning of the treatment the tuberculosis of the lung became more pronounced, more secretion tinged with blood was observed but later it improved, the discharge stopping entirely and the patient gaining in weight. Six months later the patient feels well. No relapse for four years.

CASE 2.—Male, 18 years old, family history negative. Typical scleritis of the right eye. A catarrhal condition at the apex of the right lung, and a scar adhering to the bone was visible at the outer and lower corner of the orbit, probably a result of tuberculous periostitis during childhood. Positive general reaction after injecting 0.001 gr. T. V. He was under T. R. treatment for three months receiving twenty-two injections altogether. The nodules on the sclera disappeared slowly but entirely under treatment. This patient disappeared from further observation.

CASE 3.—Female 28 years old, family history positive. Father died of pulmonary and laryngeal tuberculosis, a sister of pulmonary tuberculosis. Had a typical scleritis with sclerosing keratitis but was otherwise entirely well. A decidedly typical reaction following the injection of 0.001 gr. T. V. proved the tuberculous nature of the diseased eye. Injections of T. R. for treatment. Treated

for eight months, receiving eighty injections. After this the eye was cured. No relapse for three years.

CASE 4.—Female, 26 years old, while not predisposed by heredity, had tuberculous eruptions on various parts of her body for a number of years: thus during her childhood the third joint of the fourth finger of her right hand was removed because of caries of the bone; then again the glands of her neck became enlarged, and finally, about two months before reporting at the clinic, caries of the sternum developed, and with this a scleritis of her right eye, and later dense opacities in the cornea. Because of the history we had to consider the scleritis to be tuberculous, and this diagnosis was later proved to be correct by the typical general and local reaction to T. V. The patient was under T. R. treatment for eight months, during which time she was given fully forty-six injections. The scleritic nodule entirely disappeared, and the opacities in the cornea cleared up considerably. No relapse for four years.

CASE 5.—Female, 30 years old, while hereditarily not predisposed, but having had a sister, who died from pulmonary disease, suffered four years from recurrent scleritis which was complicated with a sclerosing keratitis. The tuberculous etiology was justified in this case of a patient otherwise entirely healthy by typical general T. V. reaction. The patient received twenty-one injections during two months in which time both eyes became entirely quiet, and the opacities of the left eye cleared up considerably so that the vision was improved from $\frac{2}{70}$ to $\frac{2}{40}$. The treatment was now interrupted for two months. During the first month of her absence the disease again appeared in the right eye. Thirty more injections, however, in a period of four months, made the cure perfect. Eight months after the termination of the treatment she has had no relapse.

CASE 6.—A female, 26 years of age, no hereditary predisposition, and otherwise entirely healthy, had for four months previous small yellowish-gray nodules developing on the sclerotic of her right eye. The cornea was still clear. The diagnosis of tubercular scleritis was sustained by the typical general and local reaction to 0.001 gr. T. V. The patient was under treatment for eight months receiving in all fifty-eight injections of T. R. During this time the scleritis got entirely well, and one and one-half years after the termination of the treatment there was no relapse.

CASE 7.—Strong male, 18 years of age, no sufficient data to prove tuberculous heredity. Sister suffered for two years from a "pneumonia" which proved fatal. Patient in his early childhood had suffered from recurrent attacks of inflammation of the eyes, which very likely were phlyc-

tenular, at least the opacities of the cornea lead one to suspect this. For the past two years he suffered from a recurring scleritis which was complicated by deep corneal opacities. Tuberculous origin was proved by typical general and local reaction to 0.003 gr. T. V. During eight months' treatment seventy-two injections of T. R. were given. The patient recovered entirely, and when last seen, two years after the termination of the treatment, was still without a relapse.

CASE 8.—Female, 31 years old. Hereditarily predisposed. Father died of tuberculosis of the lungs. During childhood she had recurrent attacks of inflammation of the eyes, most likely phlyctenular. Had a few enlarged glands on the neck, but no disease of the body which could be detected by physical examination. For four months she suffered from scleritis and sclerosing keratitis of her left eye. Typical general and local reaction after the injection of 0.001 gr. T. V. Within four months patient received thirty injections of T. R. The nodules of the sclera disappeared under the treatment, but the cloudiness of the cornea did not. We saw the patient seven months after the treatment was discontinued; she felt entirely well, and during this time she had no trouble whatsoever with her eyes. It was remarkable that during this time the cloudiness of the cornea disappeared to a great extent.

CASE 9.—Female, 47 years old, hereditarily predisposed. Father died at his 47th year of age after suffering from some lung disease for 9–10 months; three sisters and one brother died of pulmonary tuberculosis. The woman was apparently healthy, no tuberculosis of the body could be detected. Typical scleritis with sclerosing keratitis for the last two years. One attack came after the other with intervals of sometimes a few days, sometimes a few weeks. Typical general reaction after the injection of 0.001 gr. T.V.; treatment: injections of T. R. Was treated for seven months receiving sixty-seven injections. Patient recovered entirely. Up to now, two and one-half years after the beginning of the treatment, no relapse.

CASE 10.—Female, 37 years of age, family history negative. During childhood had recurrent attacks of inflammation of the eyes which left white maculæ on her cornea. When about 18 years of age, she again had some kind of inflammation of the eyes. Suffering from rheumatism for the past 4–5 years. Four years ago complained of her kidneys, no albumen in the urine at the present time. Has had scleritis and sclerosing keratitis for the last 6–7 months on both eyes. Many fine, transparent, superficial maculæ on both corneæ, iris atrophic,

posterior synechiæ on both eyes. No tuberculosis of the body could be detected by physical examination. No reaction after 0.001 gr. and 0.003 gr. T. V., but a typical local and general reaction after 0.005 gr. T. V. This patient did not submit herself to the T. R. treatment.

CASE 11.—Female, 18 years of age, family history negative. Always healthy, but very delicate, thin, and poorly developed for her age. No tuberculosis could be detected in her organism by physical examination. Caries in the left ear. For six months she suffered from a diffuse scleritis and sclerosing keratitis on both eyes; right eye complicated with an irido-choroiditis. Typical general and local reaction after the injection of 0.001 gr. T. V. She received 11 T. R. injections and showed a great deal of improvement, especially on the left eye. She did not report at the clinic after this.

CASE 12.—Female 36 years old, family history negative. Suffered from rheumatism for 3–4 years. Healthy, strong woman; no tuberculosis could be detected. For the past eight months suffers from scleritis on the right eye, slight corneal involvement. No reaction after the injection subsequently of 0.001–0.003 and then 0.005 gr. T. V. Received within six months forty-three injections of T. R. Recovery seven months after the cessation of injections; no relapse.

CASE 13.—Female, 38 years old, family history negative. Strong, apparently healthy woman. No traces of tuberculosis could be detected by physical examination. Eye trouble began four years ago. Typical scleritis with sclerosing keratitis. After the injection of 0.001 gr. T. V. typical general and slight local reaction. This patient did not submit herself to the T. R. treatment.

CASE 14.—Female, colored, 29 years of age. Mother died when about 30 years of age from pneumonia, no other pulmonary disease in her family. For the last five years is suffering from rheumatism, and has been bed-ridden several times with acute articular rheumatism. Eye trouble began three weeks ago. Typical episcleritis, no involvement of the cornea. With hot compresses and salicylate of soda recovered in about four weeks. Four months later relapse. She did not wish to submit herself to the tuberculin test.

CASE 15.—Female, 24 years of age, family history negative. During childhood suffered from recurrent attacks of inflammation of the eyes most probably phlyctenular. Otherwise has always been healthy. Strong, young woman, physical examination showed her to be healthy. Present eye trouble came on eleven months ago. Typical scleritis with the involvement of the cornea on the left eye. No reaction after the injection of 0.001–0.003 and finally 0.005

gr. T. V. Submitted to T. R. treatment, and within six months, after having received forty-seven injections, perfect recovery; one and one-half years after the cessation of the treatment no relapse.

Briefly summing up the cases we find the following results: I had under observation 3 male and 12 female patients, four of them were between 10 and 20 years of age, 6 between 20 and 30, and 5 between 30 and 50. The anamnesis shows tuberculosis in the family of 4 patients, in 2 the illness of one member of the family is suspicious of tuberculosis. In 9 cases the family history is negative. In five patients tuberculosis was present in some other part of the organism, but 10 did not show any evidences of the disease. The scleritis has in all cases been a chronic one, being present from 3 months to 4 years. In 13 cases we observed corneal complications, but in 2 the disease was confined to the sclera, one of them being an episcleritis. Six of the former 13 cases showed also iritis. I administered T. V. in 14 out of 15 cases; 12 of them gave us a positive reaction, 5 only general, 7 general and local. Two patients did not react even 0.005 gr. T. V. The local reaction is noticeable in the increase of injection, photophobia, and pain, and in some cases in the development of new small nodules. In certain cases the conjunctiva also participated in the reaction; the eyelids became œdematous, the conjunctiva red, swollen, and succulent, and discharged much muco-purulent secretion. The conjunctival involvement always disappeared without any treatment within a few days.

One patient, subject to acute articular rheumatism, and afflicted with episcleritis, did not want to submit herself to the tuberculin test; she showed improvement and later recovery under salicylate of soda. A relapse was observed 4 months later.

T. R. has been administered in 11 cases; in 10 I obtained a perfect cure, and the patients are without a relapse from 8 months to 4 years. In one case the patient got only 11 T. R. injections, showed a great deal of improvement, and then interrupted our observations by not reporting at the clinic any more. In two cases (Cases 12 and 15) where in spite of the negative result of the T.V. injection T. R. was administered, perfect recovery was obtained. Three patients, although the

T. V. showed a positive reaction, did not submit themselves to the T. R. treatment.

Finally, I want to state that in my opinion, tuberculosis is the most important, most frequent, and probably the only etiological factor in scleritis, chiefly in deep scleritis which is complicated with the involvement of the cornea, iris, and ciliary body. Rheumatism may have something to do with episcleritis.

I think a typical gelatinous scleritis is never due to lues. Syphilis may produce in the tertiary stage a gumma of the sclera, or in the secondary stage a papule of the sclera. Both of them may resemble a true scleritis, but will never have the typical symptoms and course of it.

In every case of scleritis great stress must be laid upon the correct family history, and upon the thorough examination of the patient. Even if the anamnesis and the physical examination do not reveal any evidences of tuberculosis, the scleritis itself gives rise to the suspicion of this disease. In every case of scleritis we should try the diagnostic T. V. injection, which in case of a positive reaction shows us the real cause of the disease, and also the therapy which should consist in the administration of tuberculin. Even in cases (Cases 12 and 15) in which the T. V. failed to give us a positive reaction, tuberculin injections should be administered, since they, when properly applied, are free from danger, and save the patient a great deal of suffering, and also blindness which otherwise in many cases would be incurable.

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MYDRIATICS AND MYOTICS IN INJURIES OF THE LENS AND FOLLOWING DISCISSION, TO HASTEN DISSOLUTION AND ABSORPTION OF THE LENS SUBSTANCE, AND TO CLEAR THE PUPIL AREA OF FRAGMENTS OF OPAQUE CAPSULE.

By Dr. HENRY W. WANDLESS, New York,

LECTURER ON OPHTHALMOLOGY, UNIVERSITY (N. Y.) AND BELLEVUE HOSPITAL MEDICAL COLLEGE AND CHIEF OF COLLEGE CLINIC.

IN order that we may at once understand the nature of the conditions in which this treatment is useful, I will recite the case which led up to its discovery.

Miss A. S., a woman aged 24, consulted me with reference to an injury of her left eye sustained ten days previously, resulting in the loss of vision of the eye. I found only a moderate amount of redness of the eye, but considerable pain. The eye had been struck by a whiplash which ruptured the lens capsule without rupturing the cornea. Adhesions had formed between the iris and the capsule of the lens. The pupil was contracted and irregular, there being present a mild traumatic iritis. The rupture in the capsule was rather to the nasal side and appeared ragged. The cornea showed no evidence of having been penetrated. A well developed traumatic cataract reduced the vision to perception of light. During the lapse of time since the injury, a small portion of the lens substance had been absorbed.

Under the influence of atropin and hot fomentations, the eye became quiet, and this treatment was continued eight weeks. The pupil dilated irregularly and absorption progressed rapidly. During this time nearly all of the central portion of the lens substance was absorbed, as was evident from the fact that vision with a + 7. D lens was $\frac{20}{100}$. For

the next ten days, however, no further absorption was apparent, and still another week brought no improvement, the vision remaining as before.

It was evident that no further advance could be expected without needling the remaining lens substance. I decided to do this, but as the pupil was irregular, and in order to study further the conditions incident upon its use, a solution of eserin was used for several days, followed by atropin, the pupil then dilating more regularly than it had previously. With this improvement on the credit side, I determined to continue the treatment for the purpose of study. This treatment occupied two weeks more, at which time I took the vision and to my surprise it was found to be improved. The natural surmise was that the use of eserin and atropin alternately had brought about the improvement. At this point I determined to give this treatment a more extended trial, consequently the needling operation was postponed for the time being. I soon came to the conclusion that the improvement was not fancied but real, and that it was due to the opposing mechanical effect of eserin and atropin exerted upon the lens through the ciliary muscles.

Under this treatment the patient's vision continued to improve and absorption progressed rapidly until the whole of the lens was completely absorbed, the result being that she could read $\frac{20}{10}$ readily with a correcting + 12. D lens.

The fact, which I have never noted in any other like condition, that at the beginning of this treatment only seven diopters were accepted, and that when all the lens had been absorbed twelve were accepted, may be explained, I think, on the hypothesis that the posterior surface of the capsule had only partially flattened, its convexity being maintained by the remaining peripheral lens substance.

That the process of absorption had stopped and that, further, it was immediately resumed after the application of these two agents, encouraged me to continue the study of other cases until I became satisfied as to the merits of the treatment.

The *modus operandi* of these two opposing drugs may be shown by a single crude illustration, as follows: If a sponge filled with some soluble substance be placed in water and left undisturbed, we know that it will take much longer to dissolve the substance than the time required if the sponge is occasionally squeezed out, even though the water is constantly changing, as is true of the aqueous humor of the eye. This

conclusion is the result of almost daily observation, based on the fact that dissolution of solid or semi-solid substances is hastened by frequent agitation.

It is not necessary to elaborate on the physiological action of mydriatics and myotics upon the ciliary muscles and iris, except in so far as such action affects the lens.

I am not prepared to offer proof whether atropin flattens the lens and squeezes out dissolved lens substance to be carried off by the constantly changing aqua, and eserin allows the lens fibres to relax, the lens becoming loose and sucking up within its fibres fresh aqua, or *vice versa*, but in accordance with reason the former explanation would seem correct. Suffice it to say, at least, that the alternate use of mydriatics and myotics has exactly the effect as outlined; that is to say, the one squeezes out of the lens such portions of it as have become dissolved, and the other permits the elastic lens fibres to suck up fresh aqua into their meshes.

If these conclusions be correct, and I am firmly convinced that they are, a more rapid and perfect process of lens absorption is certain. Clearing the pupillary area of portions of ruptured capsule is also equally certain in many cases, for the reason that alternate dilatation and contraction of the pupil, more or less rapid, do not permit immediate permanent adhesions to form between the iris and fragments of capsule, and if such adhesions have occurred, they are sometimes broken up or the fragments pulled aside.

In this latter connection I will cite but one instance as follows:

> A patient from whom I removed a cataract showed vision of $\frac{1}{10}$ four weeks after the operation with correcting lenses. Fearful that no better vision than this might be preserved, I instituted the alternate use of atropin and eserin for the purpose of enlarging or clearing the pupillary area of capsular obstruction. The effect was immediate, and within four weeks this patient could read with correcting lenses $\frac{10}{20}$, and at the present time his vision is even better, and he is doing clerical work, with one eye only, as the other one is useless on account of a cataract which is about mature.

It is the universal practice to place every eye with ruptured capsule, whether accidental or intentional, under the influence

of a mydriatic. This paralyzes the ciliary muscle, which condition is continued until all the lens substance is absorbed or the case is disposed of, even though several needlings are required to complete the process. In placing such an eye under a mydriatic, absorption is retarded, or at least not facilitated. Such a procedure, in my judgment, is clearly an error, which I have demonstrated on several occasions, both in injuries to the lens and in discission of soft cataracts, as well as in clearing the pupil of remnants of opaque capsule.

As a matter of fact, after thirty years of age, absorption of the lens substance becomes slow and tedious, but it may be greatly augmented by this treatment. This should not deter us in adopting the alternate use of mydriatics and myotics at any age, and especially as long as any accommodation remains.

For several years I have consistently applied this treatment to every case of injured lens with ruptured capsule, in every operation of discission, and following every cataract extraction, no matter what the age of the patient. Only a single contrary indication comes to my mind, and that is increased tension.

The choice of remedies may be a matter of individual selection. I have confined my remedies to the choice of four, atropin and eserin, and homatropin and pilocarpin, but the two former have given me more satisfaction. Their action seems more positive and I therefore depend on them most.

In children or in persons under twenty, homatropin and pilocarpin are fairly satisfactory, but in persons over twenty I seldom use the latter, as a full effect on the accommodation is desired.

The manner and frequency of applying these remedies depends upon the effect produced. One or two applications of a ½% solution of eserin will overcome permanently the effect of homatropin, but three or four days are required for eserin to combat completely the effect of atropin. Pilocarpin being less powerful than eserin, and homatropin less powerful than atropin, atropin should alternate with eserin, and homatropin with pilocarpin. The rhythmic effect of the two former used alternately seems decidedly to point to their preference.

I have found that homatropin in some cases will affect accommodation for a few hours only, and that a single drop of

pilocarpin 1% will completely overcome this. In one individual aged 47, following cataract extraction, the effect of atropin could hardly be noticed on the pupil after eighteen hours.

It is obvious, therefore, that homatropin and pilocarpin should be applied more frequently than atropin and eserin. Atropin should be used four or five times in twenty-four hours, continued from one to three days, followed by eserin solution three or four times daily for the same period or until the former is overcome. A day or two of rest should then intervene. An exact length of time for each alternate treatment can not be stated, as each case should be treated on its own merits. Homatropin and pilocarpin may be alternated daily—that is, one is used for twenty-four hours, followed by the other, but the former should be used every two or three hours, and the latter every four or five hours.

I believe that further detail is unnecessary in this connection, as all ophthalmologists are perfectly familiar with the general physiological action and therapeutic effect of these remedies as well as their application.

A REPORT OF SIX CASES OF CRESCENTIC ULCERATION OF THE CORNEA, WITH COMMENTS ON THE VALUE OF PEROXIDE OF HYDROGEN IN THEIR TREATMENT.

By Dr. JOHN DUNN, Richmond, Va.

OVER-LAPPING one another in point of time, I have had recently among my private patients six cases of crescentic ulcer of the cornea. Having an opportunity of watching these cases carefully, the observations are not without some interest.

Case 1.—Mr. L., aged 36, seen first November 16, 1909. In this case the ulceration had destroyed the upper third of the cornea, nearly to the membrane of Descemet, before he came for treatment. There was no hypopyon. The distal edge of the ulcer was undermined. No vessels of repair had started from the conjunctiva over the corneal edge. There was intense congestion of the subconjunctival structures over the upper half of the eyeball—less congestion of the conjunctiva of the lower half. There was no discharge from the conjunctiva, no conjunctivitis accompanying the ulceration. Parts of the conjunctiva most distant from the ulcerated cornea showed a white sclera beneath. The trouble had already lasted three or more weeks. Little or no treatment had been given. I am inclined to think, judging from the behavior of this ulceration under agents less severe than the actual cautery, that in this case the infectious agents no longer invaded the corneal tissue at any distance from the ulcerated surface. At the end of a week it was evident that the tendency to further ulceration had ceased, and that the reparative process had set in. The patient left for home before the destroyed area had entirely healed over. Treatment would have been futile. The satisfactory course pursued by the ulcer under this treatment

decided me not to have recourse to the various methods of cauterization.

CASE 2.—November 25, 1909. Mr. B., aged 46, leads an active, out-door life, apparently healthy, but old for his years. Mr. B. had consulted me at various times in the past for minute ulcerations of the corneal edge, which had more or less promptly healed under the use of the yellow oxide of mercury ointment. Examination of the eye at this time revealed a small cloudy area just beyond the corneal edge on the nasal side of the eye; no, or only slight, concurrent conjunctivitis. I thought at the time I was dealing with a recurrence of the old form of ulceration and ordered treatment as before. The ointment proved useless, and within two days there was a narrow ulcerated area over one-third of the periphery of the cornea. It advanced centrally, in spite of iodin, actual cautery, constant cleansings of the conjunctival sac, subconjunctival injection (this, however, was given late), until at the end of two weeks more than half the substance of the inner third of the cornea was eaten away; a hypopyon had formed and a complicating iritis was present. A paracentesis was performed and the anterior chamber reopened the second day. After this the destruction of the cornea ceased to advance, but, with relapses, it was the middle of January, 1910, before the ulcerated surface healed over.

CASE 3.—November 25, 1909, Mr. X., aged 27, neurotic; appearance of the ulceration and treatment practically identical with that in Case 2, except that the first cloudy area appeared in the mid-line of the cornea below. In spite of all forms of treatment which suggested themselves, the ulcer was not checked until the corneal substance to the lower level of the pupil had become involved and until after paracentesis had been done. In this case no hypopyon appeared. In this case also the ulcerated surface was not entirely healed over until January 15, 1910. In neither of these cases was there present any conjunctivitis save that which was necessitated by the proximity of the destructive process in the cornea. The greatest congestion was in the area adjacent to the ulcer. In neither case did there precede the corneal trouble any conjunctival disturbance save a "congestion" accompanying a "bad cold." Both patients I had treated for marginal ulcerations on several occasions before and had healed them without special difficulty and without leaving a scar. In neither case did I, at the first visit, appreciate the fact that I was dealing with an inflammatory process in any way different from those I had treated in the same persons several times before. It was noteworthy that the corneal substance seemed in both cases to melt away.

The actual cautery, iodin, nitrate of silver, etc., seemed only to add fuel to the flame—why this was so, I think, was clearly revealed in the last case to be reported here. Of these three cases, in one the ulceration destroyed deeply the upper third of the cornea; in the second, the inner third, and in the last, the lower third. In the last two, paracenteses of the cornea were followed within two days by conditions which suggested that the ulcerative process was checked—as, indeed, it was. In neither case did I notice at the first visit that there was any cloudiness about the small, apparently superficial ulceration.

CASE 4.—Mrs. Y., aged 50, dyspeptic; first visit December 22, 1909. Here again I had treated the patient several times for minute peripheral ulcerations of the cornea which had more or less rapidly healed under treatment consisting of salves and washes; only once or twice did I have occasion to apply iodin. In this case, although I could see no difference between the minute corneal cloudiness present at the upper periphery and those seen on previous occasions, as I recalled them, my experience with Cases 2 and 3, still under treatment, made me fear a repetition of their history. Accordingly, at the first visit, I applied cocain and then tincture of iodin. This I repeated for three or four days. The ulcer constantly spread peripherally and centrally, although less rapidly than in Cases 2 and 3. The iodin applications were not sufficient to check the destructive process.

CASE 5.—On December 27, 1909, Mr. K., aged 56, came to see me to know why a little scratch of the cornea, which, he supposed, had been caused by getting a cinder in his eye while out motoring two days before, would not get well. To the unaided eye nothing abnormal could be seen save a slight photophobia. Careful examination with the magnifying lens showed a slight irregularity of the corneal surface, below, at the periphery, in the midst of which was a very faint, cloudy area not larger than one-sixth the diameter of the head of a pin. The question was what to do? It was manifestly useless to try the cautery when the waviness of the corneal surface about the slight cloudy spot showed that the latter was the central focus of an infected area of indefinite extent. The conjunctival sac was cleansed with a zinc-chloride solution. Atropia was instilled, and an iodosyl-boric-acid salve was ordered to be used every hour. The next morning, December 28th, a large area of cornea had been denuded of epithelium, and the ulceration was spreading both peripherally and centrally. Tincture of iodin was applied. On the 29th the ulcer was still spreading. It then occurred to me that if I should carefully cleanse the surface

of the ulcer with dry cotton and apply a drop of peroxide of hydrogen, I might get some information. Accordingly I rubbed rather firmly the whole surface of the ulcerated area with a bit of cotton on the point of a small probe. I next applied a drop of peroxide of hydrogen. I then saw why my cautery and iodin had been useless. The hydrogen bubbles spread over the surface of the ulcer and *into the layers of the cornea to a considerable distance beyond the apparent ulceration, forming therein a white area of small bubbles.* These I was unable to press out by stroking the cornea. They, however, disappeared after a few moments. I next applied the iodin. There resulted a denuded, raw place on the cornea, of a size equal to or slightly larger than the white spot seen when the peroxide bubbles were present. The patient suffered considerably the rest of the day and night. The following morning it could be seen that the ulcerative process had ceased and we had to deal only with a non-infected ulcer of the cornea. The pain ceased before evening and the ulcer healed without further trouble. No sooner was this experiment with peroxide of hydrogen made and its first result noted than I applied it to the case of Mrs. Y. Here again the bubbles *demonstrated the presence of infectious material in the layers of the cornea at a considerable distance beyond the area of visible disturbance.* The further treatment was the same and the result equally rapid and satisfactory. It is interesting to note that although I continued the application of the peroxide of hydrogen at each visit—and I saw these patients twice daily,—*at no subsequent time did the peroxide bubbles make their way into the substance of the cornea,* although a few appeared on the surface of the ulcer.

CASE 6.—Came to me on January 1st, Mr. O., aged 58, a robust, healthy man. The "something in his eye" had followed "a congestion of the eyeball which came on with a bad cold." At the time of his first visit there was no visible conjunctival irritation. No disturbance of the cornea was visible to the unaided eye. Under strong illumination and a lens, a faint irregularity of the corneal surface and a very minute cloudy spot could be seen near the centre of the periphery of the cornea inferiorly. I ordered an ointment and asked the patient to return the following morning. With the pupil dilated there could now be seen, under a strong lens and a concentrated light, four or five minute cloudy areas near the periphery of the cornea. Cocain was applied, and then the region about the cloudy area rubbed with cotton on a probe. A drop of peroxide was placed on the surface thus prepared. Almost instantly *the full area of infection was made visible by the*

peroxide bubbles, which had worked their way into the corneal substance following the channels taken by the infectious agents. In this case no iodin was applied. During the night the patient suffered considerably from a burning sensation in the eye, to which he frequently held cold cloths. The following day it was evident that the epithelium was absent for a space equal in size to that marked out by the peroxide bubbles; while under a magnifying lens there could be seen in the raw corneal surface numerous minute ragged channels, probably those formed by the infectious agents in their advance. The ulcerated surface healed after a few days, without further spreading of the infection.

The peculiarities of the corneal ulceration in all of these six cases were: (1) the inflammation began as minute areas of infection near the corneal periphery, generally at or about the end of the vertical or horizontal meridians; (2) the infection was, at the start, beneath Bowman's membrane; (3) there was little conjunctival irritation and no marked secretion; (4) after two or three days, if left untreated, minute cloudy areas could, under a magnifying glass, be seen near the original focus; (5) the ulceration spread centrally and peripherally; (6) it seemed averse to spreading centrally, so as to occupy more than one-third or two-fifths of the corneal surface; (7) it spared Descemet's membrane for a long time; (8) it was accompanied by hypopyon only once; [(9) in one case under observation at the same time with the above six, but in the practice of another physician, the ulceration extended peripherally around the entire cornea. It extended centrally, however, no farther than the limits above given. In this case it was bilateral]; (10) the ulceration was obstinate to all forms of treatment until the peroxide of hydrogen had been used; (11) the corneal substance rapidly regenerated after the infectiousness of the ulceration had been stopped, although there was left an amount of astigmatism proportionate in a general way to the extent of the ulceration; (12) dionin hastened the disappearance of the cloudiness after repair had set in.

From none of these six cases was any information obtained as to any particular diathesis having a bearing on the causal inflammation. The patients, with one exception, all belonged to the better or best classes of the social world and

their surroundings left nothing to be desired. In no one of the cases was there present a coexisting visible conjunctivitis with secretion. The infection seemed always to begin locally at a spot along the periphery. In five of the six cases the ulceration began at or about one extremity of the vertical or horizontal meridian of the cornea. The absence of conjunctival inflammation in the early stages of these cases was remarkable. Whether the use of peroxide of hydrogen will always serve the same valuable purpose it did in the last three cases, I cannot say. I am, however, reporting them at once, because crescentic ulcerations occur so infrequently in my practice that it may be months before I see another one, and because apparently we have in peroxide of hydrogen an aid in the treatment of corneal ulceration which will be of no little value. *It is interesting to note that in no one of the last three cases did the peroxide of hydrogen, although several times used, show any tendency to invade the corneal layers after the first application.* It is further of interest to know that peroxide of hydrogen, used on the ulcers in Cases 2 and 3 after the healing had set in, showed no tendency to invade the corneal structure. Judging from the above experiences, the treatment of crescentic ulcerations of the cornea in the early stages would be as follows:

After cocain has been applied, with a bit of cotton wrapped closely about the point of a fine probe rub firmly the corneal surface over and in the neighborhood of the ulcerated or cloudy surface. Then touch the surface thus rubbed, with cotton soaked in peroxide of hydrogen, full strength. The peroxide will penetrate the cornea as far as the infectious material has invaded it and produce a whitish appearance which under a loupe will be seen to be caused by bubbles of the peroxide. No effort should be made to express these bubbles, for they disappear of themselves in a little while. A boric-acid-atropia salve should be put into the eye twice daily. The patient should insert into the conjunctival sac every hour a small piece of boric-acid salve. After the first application of the peroxide, the raw surface of the ulcer may be larger than before its use. Cold applications to the lids should be used, unless the patient's general

health contra-indicates their expediency. The peroxide should be used once or twice daily according to the severity of the ulcer. Whether additional local treatment, such as iodin, the cautery, etc., will be necessary, will depend upon the extent of ulceration. If the peroxide can do away with the now apparent necessity for use of the actual cautery, a great good will have been accomplished.

Lastly, the peroxide demonstrates why the many agents, heretofore used to check the spread of crescentic ulcer, so often failed, or accomplished the desired result only after much permanent impairment of the corneal transparency. It is not unlikely that peroxide of hydrogen may be used in most cases of corneal ulceration to determine the extent to which the infectious material has invaded the corneal substance. Its germicidal value in these difficult cases experience will decide.

REPORT OF THE PROCEEDINGS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

By Mr. C. DEVEREUX MARSHALL.

An ordinary meeting of the Society was held at the Medical Society's rooms, on Thursday, January 27th. Dr. G. A. Berry, President, in the chair.

The following specimens were shown:

Mr. M. L. Hepburn: **Hemorrhage at the macula.**

Mr. N. Bishop Harman: **Multiple superficial atrophic areas of irides in old kerato-iritis of inherited syphilis;** also **exophthalmos and facial deformity** (as in oxycephaly) without deformity of the skull-cap.

Mr. C. Blair: **Peculiar retinal changes.**

Mr. A. W. Ormond: A case of **lachrymal tumor.**

Mr. J. H. Tomlinson: **Scotomagraph with stereoscopic fixation.**

Mr. G. Winfield Roll: **Sarcoma of choroid** (with microscopic sections).

Mr. Priestley Smith: A new simple **ophthalmoscope.**

Dr. F. E. Batten read a note on a case of **bilateral ophthalmoplegia in an infant.** He referred to a case of bilateral paralysis of the third nerves in an infant shown by Mr. Jessop at the meeting of the Society on June 10, 1909. The case he now reported presented very similar symptoms.

The child, a male, æt. ten months, was the fourth of four children, the eldest of whom had died of meningitis. The child was quite well till seven months old, when a squint was noticed. When eight months old, there was some weakness of the right side of the face. The child was other-

wise quite well, and when first seen at ten months of age was a plump, rosy-cheeked child. There were marked external strabismus, double ptosis, and paralysis of all the muscles supplied by the third nerves. The optic disks were normal. There were slight weakness of the right arm and leg, and a constant rhythmical movement. The cerebro-spinal fluid was found to contain tubercle bacilli, and a V. Pirquet gave a positive reaction. The paralysis gradually extended, and the child died three months later. Optic neuritis never developed. The autopsy showed a tuberculous mass occupying the region of the corpora quadrigemina and tegmentum. From the symptoms, *i. e.* the ophthalmoplegia associated with a rhythmic tremor, it was possible to arrive at an accurate diagnosis as to the situation of the lesion, and from the examination of the cerebro-spinal fluid, an accurate diagnosis as to the nature of the lesion.

Mr. MAYOU showed a case of **congenital anterior synechiæ with buphthalmos.**

The patient was a male, æt. seven weeks, was strong and healthy, and showed no signs of syphilis. It obviously had very bad vision, but could see bright lights. There was well marked nystagmus, and the right eye had obvious excentric fixation for objects, but, as far as could be seen by focal illumination and ophthalmoscopical examination, presented no pathological change. The left eye was blind. It had the appearance of buphthalmos with bombé iris. The iris was closely applied to the back of the cornea and at the pupillary margin it had not separated off from the corneal tissue and was adherent. Descemet's membrane covered the back of the cornea nearly up to the position where the iris was adherent to the cornea, but the membrane was entirely absent in the position of the adhesion and over the whole pupillary area. The iris was thin and attenuated, especially in its mesoblastic constituents. The angle of the chamber was perfectly formed. There had been a failure of the separation of the iris at the angle of the anterior chamber, which was occluded. There was no canal of Schlemm present. The ligamentum pectinatum was very imperfectly formed, and the ciliary muscle ill developed. The suspensory ligament of the lens was absent. The lens itself was conical anteriorly, and although it was adherent to the cornea there was no anterior polar cataract or even wrinkling of the capsule. Posteriorly there was a large gap in the capsule, which was filled in by loose atypically developed fibrous vitreous, into which passed a persistent hyaloid artery with a well marked nucleated sheath. The

hyaloid artery passed backwards from the mass behind the lens to the disk. The choroid was normal. The retina was *in situ* and microscopically appeared normal, but on microscopical examination the retina in the anterior part of the globe showed a great deficiency in ganglion cells. The rods and cones in all situations were short and imperfectly developed. The optic disk presented a coloboma of the nerve sheath below and a well marked hyaloid artery coming off from its centre, around which there was some atypically developed fibrous vitreous. There was no cupping of the disk. Although the superficial clinical appearance of the eye before enucleation resembled a pseudo-glioma with secondary glaucoma, duc to an excluded pupil and iris bombé, the presence of a clear cornea together with the absence of all signs of exudation in the pupil was strongly against the probability of the defect being due to intra-uterine inflammation. The pathological examination further bore this out, and showed that the condition was undoubtedly due to mal-development. A failure in the development of the suspensory ligament had taken place. This had led to the ciliary process remaining adherent to the sides and back of the lens. These processes consisted practically of nothing more than the epiblastic element of which they were composed. The eye increasing in size had pulled the epiblast inwards, so that the situation where the processes were adherent to the back of the lens, the ora serrata, had not formed, and the retina appeared to join it close up to the ciliary processes. The anterior lenticonus was due to the lens being adherent to the cornea in front, whilst it was held firmly in position behind by the ciliary processes and persistent hyaloid artery and fibrous vitreous. Although the lens was in contact with the cornea, there was no anterior polar cataract, which was against the view that contact alone of the lens with the posterior surface of the cornea was sufficient to produce it. The drag of the ciliary processes had evidently produced a rupture in the posterior capsule, which was subsequently filled by atypically developed fibrous vitreous, and accounted for the persistence of the hyaloid artery. The imperfect formation of the retina was of interest in view of the fact that the other eye, although presenting no ophthalmoscopic change, evidently possesses bad vision, as the patient had nystagmus and excentric fixation, and did not take notice of anything but large objects; presumably the retina might be affected by similar changes. That intra-uterine buphthalmos could occur was important in view of the fact that cases had been recorded of congenital anterior staphyloma in which perforation had apparently taken place immediately before birth.

A clinical meeting was held at the Medical Society's rooms, on Thursday, February 10th, Mr. G. HARTRIDGE in the chair.

Mr. J. B. LAWFORD showed a case of **optic atrophy and oculomotor palsy** due to intracranial new growth. It was one of a small group of cases of pressure atrophy, with failure of vision, which began in the left eye, then came on in the other, eventuating in complete blindness. There was no history of causation. X-ray examination showed erosion of bone, the sella turcica was destroyed, and the bone behind eroded, back to the basilar process of the occipital bone. There was now evidence of the extension of the neoplasm into the orbits and the nose; the patient had lost the sense of smell, his voice was nasal, and there was oculomotor palsy. There was some headache, but no sickness. The growth must be in close contact with or near the pons. There was no gigantism nor acromegaly, nor undue deposit of fat. Its nature might be sarcoma or endothelioma; he did not think it was gummatous, and the man had not derived benefit from antisyphilitic remedies. The only effect of thyroid extract was to reduce the rapidity of the pulse and to produce faintness.

Mr. JESSOP mentioned two almost similar cases which he had had; one in a lady 52 years of age, whose symptoms started with some retrobulbar neuritis. The other case was in a young man, æt. 22.

Mr. DOYNE also mentioned a case, in which the eye which was blind had no affection of the disk. In the other eye optic neuritis was well marked.

Mr. LESLIE PATON said he saw Mr Jessop's case before it was operated upon, and in a case on which Sir William Gowers lectured he, Mr. Paton, cut sections of the disk of both eyes, and found a growth which pressed very definitely on one optic nerve. There was no neuritis in the eye which was blind, and vision in the other eye was $\frac{6}{6}$. He said there was a possibility that the blindness in so-called optic neuritis was not due to any œdematous process in the nerve itself, but was a normal pressure atrophy.

Mr. LAWFORD, in reply, said Mr. Jessop's cases did not seem to be median growths affecting both eyes.

Mr. LAWFORD showed a drawing of **episcleral tubercle**.

Mr. JESSOP commented on the rarity of such cases.

Mr. E. TREACHER COLLINS showed a case of **lenticonus posterior** with opaque membrane behind the lens. He discussed the varieties of the condition, and expressed the opinion that the present case was a congenital one. Behind the lens was an opaque membrane, and instead of taking the normal curvature it was depressed into a cone shape.

Dr. EDRIDGE GREEN showed and demonstrated a new form of **lantern for testing color perception**, which had now been accepted by the Admiralty. It gave a brighter light than previous patterns, and could be regulated to imitate signals at various distances.

Mr. N. BISHOP HARMAN showed cases from families with **hereditary anterior and posterior cataract;** also a **posterior lens defect** [lenticonus(?)], and a case of **iridocyclitis with gross keratitis punctata,** in which the Wassermann reaction test was positive.

The CHAIRMAN discussing the case, said but for that reaction anyone looking at it would have taken it for tubercle. Mr. DOYEN, Mr. RAYNER BATTEN, Mr. TREACHER COLLINS, Mr. MAYOU, and Mr. BLAIR discussed the case, the last protesting against the name posterior lenticonus being applied, as there was no projection of the posterior pole in the cases.

Mr. A. C. HUDSON showed an **unusual form of retinal disease** in a boy, æt. 9 years, who had $\frac{6}{9}$ vision, with full fields. When a month old, the patient had a severe illness, in which he was unconscious, and two years later he had whooping cough. In the eye there was some white mottling, with white granular material, which seemed to be deeper than the retinal vessels; it was chiefly in the macular region. He thought it likely that the condition was due to subretinal hemorrhage. Mr. ARNOLD LAWSON discussed the case, mentioning a boy with a similar condition in whom it was definitely due to hemorrhage; nearly all the hemorrhages were lying in the deeper layers of the retina, and in one or two instances the vessels seemed to be buried.

Mr. E. BREWERTON showed a case of **bilateral parotitis and cyclitis**, which he believed to be due to some general toxæmia, though he had not been able to find the source of infection.

Mr. P. E. H. ADAMS (Oxford) said that in some cases of the condition which he had described he found the infection was

from the mouth, the patients having pyorrhœa alveolaris. One patient was æt. 20, and the other 56, and in both cases there was keratitis punctata. The eyes subsided simultaneously with the parotitis.

Mr. P. FOSTER MOORE showed a case of **hole in the macula.** The vision was $\frac{6}{9}$.

Mr. HEPBURN discussed the case, remarking on the sharply-cut circular margin in both eyes, and he expressed the view that the other eye was already in an earlier stage of the same condition. It might be in the nature of an infarct in the choroidal blood supply.

Mr. FISHER thought it improbable that there would be an infarct in the identical pole in each eye.

Mr. LESLIE PATON showed a case of **connective-tissue formation on the disk,** and raised the question whether it was congenital in nature. The history was indefinite, as the parents had only noticed a defect in sight three years before.

Mr. HARTRIDGE thought it was probably congenital, that it might have resulted from inflammation during intra-uterine life.

Mr. DOYNE reminded members of a case he showed in an active stage, throwing out grayish tissue towards the retina.

Mr. TREACHER COLLINS thought the cystic-looking body was due to distension of the sheath of the central hyaloid artery, and that the white mass on the inner side was some abnormal development of fibrous tissue in the vitreous, such as was found in congenitally defective eyes.

Mr. C. WORTH showed (per Mr. HARMAN) a case of **granuloma (?) of conjunctiva,** and Mr. R. E. BICKERTON showed an **electrical method of rotating a test block** in place of cords.

Mr. TOMLINSON showed a new form of **gouge for extracting foreign bodies.**

Mr ARNOLD LAWSON showed a **swelling around the optic disk** of doubtful nature.

An ordinary meeting of the Society was held at the Medical Society's Rooms, on Thursday, March 10, 1910. Dr. G. A. BERRY, President, in the chair.

Mr. J. B. LAWFORD showed a case of **massive exudation in the retina**. There was no ascertainable family history of importance; the man was æt. 20, and was incapacitated by the failure of sight.

Mr. DORRELL showed a case of **oxycephaly**, and it was commented upon by Mr. HERBERT FISHER, who discussed the possible causation of the condition.

Mr. FISHER showed a case of **congenital cataract**, the patient having cataracts of quite different character—one lamellar and the other discoid—in the two eyes.

Mr. A. W. ORMOND showed two cases: (1) A case of **persistent mydriasis** in both eyes, and (2) a case of **transient miosis,** associated with headache. The latter of the two cases caused considerable discussion.

Dr. FARQUHAR BUZZARD said the cause, whatever it was, was acting on both sides, and suggested there was some paroxysmal condition connected with the third ventricle; or there might be a cyst in connection with the choroid plexus, which would at times block the exit, producing for the time being hydrocephalus, probably bilateral in character.

The case was also discussed by the President and Mr. RAYNER BATTEN.

Mr. BISHOP HARMAN brought forward later reports on a case shown last time as possibly **granuloma**, now shown to be a **papilloma**.

Mr. DEVEREUX MARSHALL described for Mr. T. H. BUTLER a new **folding operating table**.

Mr. FOSTER MOORE showed a case of **subretinal hemorrhage**; Mr. RAYNER BATTEN, **persistent mydriasis** following operation for high myopia; and Mr. CUNNINGHAM, a case of **vertical elongation of the cornea in congenital syphilis.**

Mr. MALCOLM L. HEPBURN read a paper on **xerosis of the conjunctiva** and **night-blindness.** He said that the hitherto accepted theory regarding the cause of this complaint, namely, torpor of the retina due to general malnutrition, could not be justified, either by the condition of the patients, or by the presence of the ordinary signs of defective circulation in the retina. A more probable explanation of the night-blindness was that certain rays of light acted prejudicially on the visual purple, causing retardation of the normal metabolism, a

theory borne out by the occurrence of this complaint during the months from May to September, when the intensity of the rays of light was presumably at its greatest. The relationship between the xerosis patches and the night-blindness presented many difficulties, and while the connection between the two seemed to be a very close one, a common cause was not easy to find. It was suggested, however, that the same rays of light which influenced the visual purple acted in some way on the conjunctival mucous glands, inhibiting their secretory function; and in support of this it was found that during the continuance of the xerosis patches the night-blindness persisted; whereas when the former were removed, the latter disappeared also. The treatment usually adopted varied considerably, since it was found that many remedies produced an amelioration of the symptoms, though the time they took to act, differed according to the special method employed. Some relied on external remedies alone, while others strongly advocated drugs internally without any local application whatever. Bandaging the eyes for a short time had alone been known to give relief, and whatever treatment might be used must evidently not only modify the action of the special rays of light on the conjunctiva, but also their path through the pupil to the retina, since in no other way could the simultaneous improvement in the two prominent symptoms be explained. Arising out of the discussion of this subject, it appeared that there was some reason for thinking that congenital night-blindness, xerosis of the conjunctiva and night-blindness, and the night-blindness of malnutrition might be due to a common cause.

Dr. LEVY said cases which he saw showed fundi which were paler than ordinary, and he thought the paleness of the fundi had something to do with the disease. But Mr. Hepburn had not borne that out. However, he thought albinos did not, as a rule, show night-blindness, and they saw better in the night than in the day. He agreed that malnutrition had nothing to do with it. He had not seen xerosis alone.

Mr. S. MAYOU said that some years ago he examined a number of such cases, and found the changes in the epithelium were in the direction of creatinization, due, perhaps, to the

fact that the disease occurred during the prevalence of hot, dry winds.

Mr. DEVEREUX MARSHALL pointed out that the macula did contain visual purple; it was not thought to, because the visual purple bleached quickly in light. It had also been said that the bat's eye did not contain visual purple; this was wrong, for it contained a photo-chemical substance which acted precisely like visual purple.

Mr. MOLD, Mr. JOHNSON TAYLOR, Mr. SYDNEY STEPHENSON, and Mr. HARMAN continued the discussion, and Mr. HEPBURN replied.

Mr. R. R. JAMES read a paper on a contribution to the **bacteriology of panophthalmitis.**

He related the case of a laboring man who was admitted into St. George's Hospital in November, 1909, with what appeared at first to be an orbital cellulitis following a wound of the upper lid received a couple of days before. There was marked proptosis and extreme chemosis, with haziness of the cornea, but no hypopyon. Incisions were made in the lids, but no pus was found. Patient's general condition, which was extremely bad on admission, began to improve, but a couple of days later the conjunctival sac was found to be lined with a tough membrane. The eye was still proptosed, the cornea was uniformly yellow in color, and gas bubbles and pus were observed issuing from a tiny spot at the upper part. The hole was enlarged and the contents of the globe scraped out, and the man made a slow but uneventful recovery. The bacteriological report by Dr. SLATER showed that swabs from the pus yielded a streptococcus and a large Gram-positive, immobile, non-sporing bacillus, closely related to, if not identical with, the bacillus aërogenes capsulatus. The results of cultivation on milk, potato, gelatine, and broth were given, and also the results of inoculation of a guinea-pig. The animal rapidly died, and the post-mortem findings were similar to those described in a previous paper on acute spreading gangrene, by the writer (Mr. James).

The paper was discussed by Mr. MAYOU, and Mr. JAMES replied.

REPORT OF MEETINGS OF THE SECTION ON OPHTHALMOLOGY OF THE NEW YORK ACADEMY OF MEDICINE.

By Dr. EDWARD B. COBURN, Secretary.

STATED MEETING OF THE ACADEMY, MONDAY, JANUARY 6, 1910. DR. JOHN A. WYETH, PRESIDENT OF THE ACADEMY, IN THE CHAIR.

Dr. GEORGE S. DERBY, of Boston, read a paper entitled, **The best methods for the diagnosis and treatment of ocular tuberculosis**, which is printed in full in this number, page 217.

Dr. CARL KOLLER presented a case of **tuberculosis of the conjunctiva and a microscopic specimen** from the same case.

The patient was an apparently healthy young man of 21 years, without any signs of pulmonary tuberculosis. For about two months before being referred to him, the patient had been treated by his family physician for an affection of the lower lid which looked like an infarct of the Meibomian gland. There were three inflamed chalazia of small size in the tarsus of the upper lid, the cutis of which showed considerable venous congestion. The affection on the lower lid presented itself as a small wedge near the free edge of the tarsus, intensely red, but neither ulcerated nor raised above the conjunctival surface of the tarsus, but protruding over the free edge of the tarsus like a pouting lip. With a strong loupe, small nodules could be seen beneath the surface between the ducts of the Meibomian glands on both sides of the wedge-shaped formation. A small portion of the latter was excised and under the microscope typical tubercles were seen imbedded in tissue presenting the appearance of active inflammation (most likely the effect of former cauterization). Similar nodules were seen on the tarsal conjunctiva of the upper lid situated over one of the suppurating chalazia. This patient has not been treated with tuberculin

but by repeated scarification and solutions of silver nitrate with excellent results.

Dr. ERVIN TÖRÖK read a paper on **The etiology of scleritis; its treatment and the results with tuberculin,** which appears in full in this number, page 230.

DISCUSSION.

Dr. EMIL GRUENING said that, generally speaking, cases affecting the anterior half of the globe were but rarely due to tuberculosis. He did not agree that scleritis was invariably due to tuberculosis. Scleritis might be due to tuberculosis in rare cases, but the majority were due to other causes. Scleritis was recognized long before tuberculin injections were employed, and even the recurrent cases of scleritis yielded to aspirin and hot applications. If we maintain that scleritis is due to tuberculosis, then we must hold that tuberculin is necessary for its cure. Parenchymatous keratitis might in rare instances be due to tuberculosis, but in the great majority of cases the disease was undoubtedly due to inherited syphilis, and yielded to local treatment with dionin, atropin, hot applications, and general treatment with potassium iodide and mercury.

Dr. CHARLES STEDMAN BULL said that it is a well recognized fact that the tuberculous ocular lesion may be primary and the only existing focus of infection in the body. It is also known that when the lesion spreads from the interior to the exterior of the eye the foci of disease may always be found in the filtration angle. The presence of indurated glands is not pathognomonic but of great diagnostic value. We know from Mr. E. Treacher Collins that the reaction of the tissues to the various tuberculin tests consists of an aggregation of cells, made up of a central giant-cell, the so-called Langhans cell, epithelioid cells, and lymphocytes. These three conditions, the cellular aggregation, the giant-cell system, and the caseous degeneration, found together in a tissue, make a diagnosis of tuberculosis practically certain. The presence of the tubercle bacillus in the tissue is proof of the tuberculous nature, but failure to find it does not disprove the tuberculous nature of the lesion. The reaction from the tuberculin tests are of three

varieties: 1st. The local reaction at the point of puncture, which is slight and delicate. 2d. The ocular reaction, which should be unmistakable. 3d. The general constitutional reaction. I have abandoned the conjunctival test as I consider it liable to cause a most obstinate and severe conjunctivitis in a perfectly healthy eye.

The examination of patients for suspected tuberculosis of the eye should be as follows: 1st. A thorough physical examination of the nose, throat, lungs, joints, etc. 2d. A careful statement of the existing diseased condition of the affected eye. 3d. The examination with tuberculin (cutaneous and subcutaneous tests).

Tuberculin Treatment: In reference to the use of tuberculin as a therapeutic agent, I have used the T. O. of Koch, the T. R. supplied by Merck, and two preparations of Alexander & Co., of Marietta, Penn., one a 50 per cent. solution of tuberculin and the other original tuberculin, T. O., prepared after the method of Koch, and I prefer the latter. The tuberculin excites a reactive inflammation in the surrounding tissue, and this results best from small, gradually increasing doses. Relapses are frequent, but occur with diminishing frequency if the treatment is carried on for months.

Dr. JOHN E. WEEKS indorsed what had been said about the use of tuberculin in the diagnosis of tuberculosis—that is, that there must be a local reaction in the eye before stating positively that tuberculosis of the eye exists. He had employed **the skin reaction and the conjunctival reaction** but he did not consider them of great value, for even with a positive reaction it did not prove that the ocular disease was tuberculous. It simply showed that there was a focus somewhere in the body. At autopsies a large percentage showed some form of tuberculosis from which they had recovered. Tuberculosis of the conjunctiva presented two forms. First, acute miliary tuberculosis. In inoculation experiments, tubercles developed rapidly on the ocular as well as the palpebral conjunctiva. They resemble trachoma granules. Second, there was a chronic form of tuberculosis of the eye which resembled lupus. This consisted of a localized superficial ulceration of the conjunctiva with ragged borders. In tuberculosis of the eyeball, the cornea and sclera present characteristic appear-

ances in the isolated foci. When these are present it means that the condition in the sclera is invariably due to tuberculosis. There are many cases of scleritis which present clinical appearances which do not correspond to the inflammation caused by tuberculosis. Scleritis may be caused to disappear by treatment other than for tuberculosis, as, for instance, by salicylate of soda. He reported a case of two years' standing, which did not present the grayish foci peculiar to tuberculosis, and all symptoms disappeared after using sodium salicylate. Other methods of diagnosis were by the microscope and by inoculation, but one was not always able to demonstrate the tubercle bacillus in the tissue. In such cases, introduction of a piece into the anterior chamber of a rabbit would produce tuberculous iritis in three or four weeks. Another method was by exclusion. A negative result from the administration of potassium iodide, mercury, and salicylates in the absence of definite symptoms of a malignant growth, would point to the tuberculous character of the inflammation. Dr. Weeks quoted from a paper of Dr. Trudeau as to the method of using tuberculin for diagnostic purposes. Dr. Weeks had used the tuberculin prepared by the Health Board of New York City. He had also found it excellent for treatment as well as for diagnostic purposes even though heated to 70° to 80° C. The new tuberculin of Koch, was not heated to such a degree, and its therapeutic effect was probably greater than the old tuberculin T. O. The method employed by von Hippel began with 0.05*mg*, and gradually increased the dose. Another form of tuberculin that is probably more active than T. R. was the bouillon filtre (B. F.) of Denys. Tuberculosis of the eye is not extremely common since as in three years he had treated only eleven cases. Of these eleven cases, one was tuberculosis of the iris, four of the choroid, three of the cornea, and three of the cornea and sclera. In all of these cases he had obtained a local reaction. The therapeutic effects of the treatment with tuberculin had been satisfactory.

Dr. WILBUR B. MARPLE said that, although he had used tuberculin extensively as a diagnostic aid in various ocular lesions the etiology of which was in doubt, the results had in most cases been negative. In two cases in the past year the results so far as treatment was concerned were satisfactory.

One of his cases was a young colored girl, aged 22 years, of good general health and with no evidence of tuberculosis elsewhere. A diagnosis of kerato-iritis of the left eye was made and specific treatment was commenced, but she grew steadily worse and after a few weeks disseminated nodules began to appear in the iris. Tuberculin was given in ascending doses, and though there was no local or constitutional reaction during the period of three weeks during which she received injections, the appearance of the eye underwent remarkable changes. In two months the symptoms had all subsided and the tubercles had disappeared. In this case diagnostic injections of T. O. were employed. She was discharged, and six weeks subsequently she reappeared with exudate in the anterior chamber and several tubercles in the iris and vision much reduced. She was then placed on T. R. $\frac{1}{60}mg$ hypodermically every three days, increasing the doses by the same amount each time. She improved rapidly until she left the city and treatment was continued by a colleague. Dr. Marple concluded as follows: 1. For diagnostic purposes begin with very small doses and increase slowly to avoid excessive reaction. He began with $1mg$ of T. O. subcutaneously and increased to 3 or $4mg$ or more. No reaction followed and he had repeated the injection every 3 or 4 days It has been amply demonstrated that tuberculin hypersusceptibility may be produced in patients in whom the diagnosis had been made only by the tuberculin test, so that the one reaction which the test had developed had made the individual, slight though the disease was, for a long time so susceptible to the toxin that it became extremely difficult to produce any tolerance when the treatment was begun. 2. The treatment must be continued several months. Both of his cases (iritis) relapsed when treatment was discontinued after six weeks and two and one-half months respectively. Both patients began to improve when treatment was resumed. One case was under treatment six months and the other was still under treatment. 3. In the treatment, very small doses of T. R. should be given at first. His patients received $\frac{1}{3}$ mg, and increased by the same amount more each time until they received $\frac{1}{3\frac{1}{7}}mg$. Injections were made twice a week. He had followed Dr. Trudeau's suggestions (*American Journal of Medical Sciences*,

June, 1907) as to size and frequency of the doses. 4. A negative reaction general or local did not prove that the case was not tuberculous. His first patient never gave any reaction and yet was entirely cured of the iritis with tuberculin injections.

Dr. ARNOLD KNAPP said that there were undoubtedly a great many cases of ocular tuberculosis which were not recognized. He thought that a subcutaneous tuberculin test should be applied in every chronic eye case with indefinite clinical symptoms. The local reaction was, of course, reassuring, but in certain cases of choroiditis it might be absent, though the case was unquestionably tuberculosis. He had never seen the local reaction during the diagnostic test cause any retardation in progress toward recovery; on the contrary, there had often been a surprising improvement which sometimes did not persist. In general, the best results were seen in tuberculosis of the conjunctiva, cornea, and sclera, while in most affections of the deeper parts of the eye the results were disappointing. It had seemed to him that a great deal could be done for city patients if we were able to look after their general health and to keep them in better hygienic conditions. He thought that the tuberculosis class which Dr. Derby described as a feature of the work of the Massachusetts Eye and Ear Hospital should unquestionably be a part of every eye hospital.

MEETING OF MONDAY, FEBRUARY 21, 1910, DR. H. W. WOOTTON, CHAIRMAN, PRESIDING.

Present, thirty-two members.

Dr. J. H. CLAIBORNE presented a case of **tumor of the orbit** with the following history.

Two years ago the patient noticed that her left eye was becoming smaller, and the headaches from which she had been suffering were becoming worse. *Status præsens:* The woman is pale and badly nourished. The eyes are not on the same plane, the left being displaced downward and occupying a position 13*mm* lower than the right. Motility is normal except in upward movements. There is marked ptosis and the eye is slightly divergent. The optic disk is ill-defined.

The field is normal. Vision is R $\frac{6}{9}$ and L $\frac{15}{200}$. Under the left orbital ridge a tumor may be felt about the size of a large mulberry. It is slightly movable and seems to be attached to the roof of the orbit. It measures about *22mm* by *8mm*. Lachrymation is constant and has been so for two years. The headache, lachrymation, and displacement of the eye all began about the same time. A skiagram of the patient's head shows a shadow due to the tumor in the orbit. Treatment with KI had caused great relief from the headaches. It was apparent that a tumor of the orbit was present, but whether a simple enlargement of the gland or tumor it was difficult to say. He inclined to the belief that it was some kind of a tumor of the lachrymal gland. The opinion of the members was desired as to the nature of the tumor, whether it should be removed and the best method of procedure.

In the discussion, Dr. R. DENIG asked if there was any specific history.

Dr. A. KNAPP said that he thought the case was well suited for a Krönlein operation and that it was probably a sarcoma.

Dr. P. A. CALLAN said that it was best to remove such growths. He did not think a Krönlein was necessary, but that it could be approached below the eyebrow without causing any resultant deformity. He did not think it was a malignant growth, as the tumor was so long (two years) in developing. It might, however, become malignant and so should be removed.

Dr. CLAIBORNE, in closing, said that there was no history and no evidence of syphilis.

Dr. R. DENIG made a suggestion for an **operation for chronic glaucoma,** with presentation of a case.

In such cases of chronic glaucoma as do not yield to iridectomy, Dr. DENIG makes the following suggestion. To effect a leakage between anterior chamber and subconjunctival space, a conjunctival flap is dissected, about *3mm* wide and *2cm* long, extending from the limbus of the superior corneal margin way back to the equator of the bulbus. After isolating the flap, it is left in place and the section for iridectomy is performed. On finishing the section, care has to be taken not to cut off the conjunctival flap near the limbus. The next step consists in making a perforation of the cornea at a distance of about *2mm*

from the limbus and about 3½ to 4*mm* in width. The conjunctival flap—the peripheral end of which has been cut off—is then turned at its base and pulled through the anterior chamber and the corneal wound. In this way a loop is formed through which the flap is pulled, the epithelial layers of the flap being expected to rest on each other. The end of the flap is then buried subconjunctivally, the conjunctiva being undermined on both sides and closed by sutures. Taking the formation of a loop by pulling a conjunctival flap through a perforation of the cornea as the essential basis of this operation, the establishment of a leak between anterior chamber and subconjunctival space may be accomplished in more than one way: for instance, two small lateral flaps, one on the nasal and one on the temporal side of the limbus, could be dissected and drawn through the loop and turning one of them in order to set epithelial layer on epithelial layer. Or, an elliptic hole could be cut out—half of the hole comprising the corneal edge, the other the corneal end of the flap, and then be covered by the flap. Dr. DENIG thinks there are possibilities for use of such a flap for staphyloma of the cornea, keratoconus, and kerato-plastic operations. He has operated in this way four times to effect a leakage between the anterior chamber and the subconjunctival space. He also showed models demonstrating the different methods he had described.

In the discussion, Dr. A. KNAPP asked why it was necessary to pull the flap through the corneal incision, and whether it would not be sufficient to put the end of the flap into the anterior chamber.

Dr. P. A. CALLAN said that the tendency in all operations for the relief of chronic glaucoma is to form a cystoid cicatrix. He described the method of Holth of Christiana and said he had operated on five cases in that way. Some reaction had followed. He quoted the methods of Stephenson, Vacher, and Lapersonne who use punches. This causes too much injury and is too elaborate. His great regret is that patients come too late. Better results are secured if the patients consent to operation earlier. In certain cases he makes only a buttonhole opening in the periphery of the iris. He does not think that it is the iridectomy alone that counts, and if the wound closes quickly the results are not so satisfactory.

Dr. W. B. MARPLE said that the search for new operations showed the futility of our present methods of treating chronic glaucoma. He referred to Lagrange's methods and others and to Meller's experiments with the tonometer, finding distinct lowering of the tension by the Lagrange operation.

Dr. L. EMERSON reported on a case of **double hard cataract** in an otherwise healthy man of 35 years of age. The patient was a laboring man in good physical condition. He had well-marked hard cataracts, and one side was operated on after performing a preliminary iridectomy. The lens was hard and there was no cortical substance. Vision ten weeks ago was $\frac{4}{200}$. Vision in the other eye was $\frac{20}{100}$, and would be operated soon.

In the discussion, Dr. P. H. FRIDENBERG asked the man's occupation. Sclerosis of the lens is often ascribed to heat and referred to bottle-makers' cataract. He said that he had seen many cases at the New York Eye and Ear Infirmary, in those exposed to heat.

Dr. J. GUTMANN stated that he had seen at the New York Ophthalmic and Aural Institute a woman, 28 years old, who had hard cataracts in both eyes.

Dr. EMERSON replied that the man was a driver.

Dr. C. KOLLER presented a case of **miliary tubercle of the choroid.** The patient, a young woman aged 32 years and in good health, consulted him three and one-half years ago because of failure of vision of the right. Vitreous opacities were visible with the ophthalmoscope, and two patches of choroidal atrophy, larger than the optic disk. Three weeks ago she appeared again with the complaint of disturbed vision for four weeks. There were fine, floating opacities of the vitreous, and below the optic disk was a chain of four choroidal foci, two old and two new. One had a bluish-white, opalescent color, and raised above the choroidal surface, unpigmented and non-vascular. The older was bordered with pigment masses and with connective-tissue formation. Between the two old foci is an irregular, dim focus, covered by œdematous retina. Four weeks later no changes were noted except in the last mentioned focus, which now showed some scattered pigmentation with thinning and atrophy of the choroid. At present one of the patches is in the beginning of

the atrophic stage, while the protruding nodule has flattened and has entered the stage of resolution. No deposits were observed in the anterior chamber or on Descemet's membrane, probably due to the fact that the patient did not come during the acute stage. This case resembles one of Sydney Stephenson (*Trans. of Ophthal. Soc., United Kingdom*, vol. xxviii., 1908), in which he demonstrated tubercle bacilli in the aqueous after paracentesis of the anterior chamber.

Dr. W. B. MARPLE did not think the case was one of tuberculosis. He thought the time, three weeks, was too short for the exudate to disappear. Besides it did not present the typical appearance.

Dr. P. H. FRIDENBERG spoke of a case of Dr. Cutler's where injection of tuberculin partially confirmed the diagnosis, as there were changes in the fundus and increase of haziness. Marked destruction in the periphery was noticeable, and in this case the pigmentation did not resemble the usual tubercular lesions. It might, however, be an atypical form.

Dr. SCHIRMER said that we often observe cases of tuberculosis, but we are not justified in calling them miliary tuberculosis. There were no signs of tuberculosis to be found in this patient.

Dr. KOLLER replied that he was not surprised that the case did not seem to be one of tuberculosis. Our ideas on the subject ought to be broadened. Four weeks ago he showed a case before the Academy of Medicine. He had treated many such cases which he did not then think were tubercular. In this case there was no indistinct picture, but a definite, elevated pearly mass which was present four weeks before he saw it.

Dr. MARPLE asked if this fuzzy appearance was pathognomonic of tuberculosis.

Dr. KOLLER explained that it was present with neuritis and exudative choroiditis, but was not pathognomonic of tuberculosis. It may also be seen in syphilis.

Dr. J. R. SHANNON presented a case of **partial iridodialysis exposing the ciliary processes.** The patient was struck in the eye by a rubber plug while inflating a bicycle tire. When seen, the eye was red and the anterior chamber was filled with blood. The iris was torn from its attachment for some

distance on the nasal side. A slight opacity of the lens was observed, and through the opening in the iris could be seen four or five of the tips of the ciliary processes. Vision was $\frac{20}{70}$. A colored drawing was shown.

Dr. P. H. FRIDENBERG presented a **stigmometric test chart and test-types for children and illiterates.** See p. 227 of this number.

Dr. SCHIRMER asked if Dr. Fridenberg laid stress on the square forms, as the round forms were used in Germany. He said that these tests were better than the Jaeger types.

Dr. L. EMERSON thought that the distance test card is of value. With the Snellen pitchforks much time and patience was lost. He always used retinoscopy in children.

Dr. FRIDENBERG explained that the square forms were used because of ease in lithographing and ease of determining the exact size. Furthermore, these dots cannot be memorized.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY IN THE FIRST AND SECOND QUARTERS OF THE YEAR 1909.

By Dr. G. ABELSDORFF, in Berlin; Prof. ST. BERNHEIMER, in Innsbruck; Dr. O. BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, in Berlin; with the assistance of Prof. A. ALLING, New Haven; Prof. E. BERGER, Paris; Prof. CIRINCIONE, Genoa; Dr. DALÉN, Stockholm; Prof. HIRSCHMANN, Charcow; Dr. J. JITTA, Amsterdam; Mr. C. DEVEREUX MARSHALL, LONDON; Dr. H. MEYER, Brandenburg; Dr. P. VON MITTELSTÄDT, Metz; Dr. H. SCHULZ, Berlin; Prof. DA GAMA PINTO, LISBON; and others.

Translated by Dr. MATTHIAS LANCKTON FOSTER.

Sections I.–III. Reviewed by Prof. C. HORSTMANN, Berlin.

I.—GENERAL OPHTHALMOLOGICAL LITERATURE.

1. BIRCH-HIRSCHFELD, A. "The Diseases of the Orbit." *Graefe-Saemisch's Handbook of Ophthalmology.* Second revised edition. Leipsic: W. Engelmann, 1909.

2. HIRSCHBERG, J. "History of Ophthalmology." *Ibid.*

3. FREYTAG, GUSTAV. *Archives of Comparative Ophthalmology*, vol. i., No. 1. Leipsic: S. Hirzel, 1909.

4. INOUYE, T. **The visual disturbances from shot wounds of the cortical visual centre, from observations on the wounded in the last Japanese war.** W. Engelmann, 1909, Leipsic.

5. HESS, C. **International test-types using Landolt's rings.** Wiesbaden: J. F. Bergmann, 1909.

6. ELOUI-PACHA. **Flies and ophthalmia in Egypt.** *Rev. génér. d'opht.*, xxviii., p. 193.

7. ELOUI-PACHA. **A word concerning the blindness and the amelioration of the blind in Egypt.** *Ibid.*, p. 241.

8. SNEGIREFF, K. W. **The eyes of deaf-mute children.** *Med. Obosren.*, 1909, No. 4. *Klin. Monatsbl. f. Augenheilk.*, xlvii., ii., 1, p. 65.

9. WALKER, A. N. **On the work of the ophthalmia ward in St. Paul's Hospital, Liverpool.** *Ophthalmoscope*, June, 1909.

10. WALSH, J. J. **Pope John XXI., the ophthalmologist pope.** *Ophthalmology*, Jan., 1909.

BIRCH-HIRSCHFELD (1, **The diseases of the orbit**) first deals with the changes in the eyeball and its adnexa produced by pathological changes of position. Then he describes the inflammatory diseases of the orbit, considering first the anatomical relations, which are of importance, œdema of the orbit, inflammation of the bony wall and of the periosteum, inflammation of the orbit associated with inflammation of the accessory sinuses of the nose. In another chapter he deals with inflammation of the retrobulbar tissues, including the involvement of the orbit in thrombosis of the cavernous sinus, syphilis and tuberculosis, as well as the rarer diseases actinomycosis and anthrax. Then follow tenonitis and the inflammatory pseudo-tumors of the orbit.

In this part of the history of ophthalmology HIRSCHBERG (2, **History of ophthalmology**) speaks of the foremost ophthalmologists of the 18th century and of their writings.

FREYTAG (3, **Archives of comparative ophthalmology**), with the collaboration of a number of other authors, has brought out an "Archiv für vergleichende Ophthalmologie," to be a central organ for the anatomy and physiology of the eye of all animals, vertebrates and invertebrates. It will appear as a quarterly and will contain original articles in its first part, with a review of all advances in comparative ophthalmology in its second. The present number contains articles on the dilatator pupillæ in birds, by Lietschmann; the behavior of the pupils in inhalation narcosis, by Nakawaza; the elastic tissue of the iris in adult man and in other species of vertebrates, by A. de Lieto Vellaro; and the indices of refraction of the lens and of the fluid media of the eye in cats and rabbits, by G. Freytag.

The statistics of shot wounds of the eye after a war are difficult to obtain and it is rarely that an ophthalmologist can find time and leisure for thorough observations. In this work, INOUYE (4, **The visual disturbances from shot wounds of the cortical visual centre**) has collated thirty cases, met with in the war in China in 1900 and the Russo-Japanese war. The wounds were mostly made by small-sized bullets from

an average distance of 520*m*. Loss of consciousness was absent in only one case; the wounds healed readily. Among the brain symptoms, motility, sensibility, reflexes, disturbances of reading and writing, cortical blindness, disturbances of the hearing and taste are described. The eye symptoms, flittering before the eyes (Flimmern), photopsia, pain, sensation of pressure, vision, etc., are discussed. In the visual field he found hemianopsia dextra, sinistra, inferior, and quadrata; scotomata, concentric contractions, and other non-homogeneous defects. The ophthalmologist will find pleasure in the exact form of the observations, measurements, and drawings, while surgeons, neurologists, psychiatrists, and clinicians will find much of value.

The international test-types of HESS (5, **International test-types using Landolt's rings**) are brought forward by him as the chairman of the commission for the introduction of a uniform estimation and designation of vision. They are intended for examination at the distance of five metres. The vision is to be expressed in decimals of the unit of vision. The test-types are based on the fact that a normal eye can usually distinguish as separate two points seen at an angle of one minute. Both charts contain Landolt's rings and numbers which were made according to this principle.

ELOUI-PACHA (6 **and 7, Flies and ophthalmia in Egypt; A word concerning the blindness and the amelioration of the blind in Egypt**), who in 1883 and 1885 found 85% of the scholars in the schools in Egypt suffering from trachoma, finds, as the result of proper hygiene, the removal of putrid substances that serve to draw flies, which he believes play a principal part in the dissemination of trachoma, and particularly of the polikliniks and flying columns established by Sir Ernest Cassel, the number suffering from this disease reduced to 60, 45, and even 32%

BERGER.

SNEGIREFF (8, **The eyes of deaf-mute children**) examined the eyes of 100 deaf-mutes, 65 boys and 35 girls, between the ages of 9 and 19. The deafmutism was congenital in 51.76%; in the remainder it was the result of various diseases between the ages of 1 and 7 years. The refraction was emmetropic in 28, hypermetropic in 63, and myopic in 9. The vision was

from 1.5 to 1 in 78%, from 0.9 to 0.5 in 12%, and from 0.5 to 0.07 in 10%. The most frequent causes of bad sight were retinitis pigmentosa, optic atrophy, and congenital amblyopia.

HIRSCHMANN.

WALKER (9, **The work of the ophthalmia ward at St. Paul's Hospital, Liverpool**). This ward was opened for the immediate treatment of infants attacked by ophthalmia neonatorum. In Liverpool a midwife is compelled to notify this disease to the Health Authority, and whenever consent can be obtained the case is at once either admitted to the ward or treated as an out-patient. The ward contains 4 beds and 4 cots, but it is hoped to enlarge it. The mother is generally admitted with the child. The statistics for the first year were: 75 cases; in 57 both eyes saved; in 7 one eye saved; blindness in 7; and no record of four. Of the 7 cases losing both eyes, 5 had both corneæ sloughing on admission. The paper does not state what treatment was adopted.

T. HARRISON BUTLER.

WALSH'S (10, **Pope John XXI., the ophthalmologist pope**) interesting, historical article relates to Peter of Spain, later pope, who lived in the thirteenth century. He shows evidence of the knowledge at that time of subjects which we consider to be recent advances in science. The pope's book on diseases of the eye indicates an insight into many ocular diseases, and while the therapeutics are mostly obsolete they are in advance of the treatment of diseases of other parts of the body.

ALLING.

II.—GENERAL PATHOLOGY, DIAGNOSIS, AND TREATMENT

11. SISSON, E. O. **Query into the effect of intense sunlight on the eye of the blond type.** *Ophthalmology*, Jan., 1909.

12. SCHANZ J., and STOCKHAUSEN, K. **The action of the ultra-violet rays upon the eye.** *Arch. f. Ophthalm.*, lxix., 3, p. 452.

13. BEST, J. **Injuries of the eyes by luminous and ultra-violet rays.** *Klin. Monatsbl. f. Augenheilkunde*, xlvii., i., 5, p. 520.

14. BIRCH-HIRSCHFELD. **The injury of the eye by light, and its prevention.** *Fortschr. d. Medicin*, 1909, p. 238.

15. ZUR NEDDEN, M. **The natural curative factors of infectious eye diseases and their suitable artificial assistance.** *Klin. Monatsbl. f. Augenheilkunde*, xlvii., i., 1, p. 1.

16. TSCHIRKOWSKY, W. **Experimental observations concerning the action of an infection produced by non-pathogenic microbes of the conjunctiva in an eye that has been operated on.** *Ibid.*, Supplement, p. 123

17. HILBERT, R. **Pathological color sensations in consequence of surgical diseases.** *Klin. Monatsbl. f. Augenheilkunde*, xlvii., ii., 3, p. 290.

18. SYNDACKER, E. F. **Differential diagnosis between headaches due to ocular defects and those caused by inflammations of the accessory sinuses.** *Klin. Monatsbl. f. Augenheilkunde*, xlvii., i., 6, p. 629.

19. LOEHLEIN, W. **The action of gallic acid salts upon gonococci and conjunctival secretions containing gonococci.** *Ibid.*, i., 3, p. 237.

20. ALT. A. **Some interesting tumors.** *Am. Jour. of Ophthalmology*, Jan., 1909.

21. HARRINGTON, A. W., and BALLANTYNE, A. J. **Remarks on the use of Calmette's ophthalmo-reaction for tuberculosis.** *Ophthalmoscope*, June, 1909.

22. RANDOLPH, R. L. **A case of Mikulicz's disease.** *Ophthalmic Record*, Jan., 1909.

23. STANCULEANO, G. **Contribution to the experimental study of corneal tuberculosis.** *Annales d'Oculistique*, cxli., p. 276.

24. GRIMSDALE. **The treatment of septic conditions of the eye by means of vaccines.** *Ophthalmoscope*, Jan., 1909.

25. GRADLE, H. **Staphylococcus vaccination in phlyctenular disease.** *Ophthalmic Record*, June, 1909.

26. CORBUS, B. C., and HARRIS, F. G. **The diagnosis of syphilitic eye lesions by means of the spirochæta pallida and the serum reaction of Wassermann.** *Ophthalmic Record*, June, 1909.

27. PADERSTEIN. **Optic atrophy from atoxyl and arsacetin.** *Berliner klinische Wochenschrift*, 1909, No. 23

28. IGERSHEIMER. **Atoxyl poisoning, with special reference to its action upon the eye.** *Deutsche med. Wochenschrift*, 1909, No. 26.

29. IGERSHEIMER. **The effect of atoxyl upon the eye.** *Arch. f. Ophthalmologie*, lxxi., 2, p. 379.

30. BEHSE, EMIL. **Experimental studies concerning the effect of quinin upon the eye.** *Arch. f. Ophthalm.* lxx., 2, p. 239.

31. SAUVINEAU. **Iodoform amblyopia.** *La clin. ophtalm.*, 1909, p. 345.

32. RUPERT, J. **The influence of adrenalin upon the intraocular tension.** *Zeitschrift f. Augenheilkunde*, xxi., pp. 97 and 224.

33. HAPPE, H. **Experimental studies of non-specific serum therapy. I. The effect of yeast feeding and of Deutschmann's serum upon infected rabbits' eyes.** *Klin. Monatsbl. f. Augenheilkunde*, xlvii., Supplement, p. 167.

34. THOENESSEN, JOSEF. **Treatment of eye diseases with Deutschmann's serum.** *In. Diss.*, Giessen, 1909.

35. MIJASCHITA, S. **Experimental studies concerning the action**

of subconjunctival injections of air. *Klin. Monatsbl. f. Augenheilkunde*, xlvii., i., 5, p. 948.

36. Webster Fox. **The present status of Mules' operation and of delayed implantation of a gold ball.** *Ophthalmoscope*, Jan., 1909.

37. Loeb, C. **Hereditary blindness and its prevention.** *Annals of Ophthalmology*, Jan., 1909.

38. Diller, T. **Hysterical blindness.** *Jour. Amer. Med. Assoc.*, Apr., 24, 1909.

39. Fryer, B. E., and Lichtenberg, J. S. **A case of amaurotic family idiocy.** *Ophthalmology*, Apr., 1909.

Sisson (11, **Query into the effect of intense sunlight on the eye of the blond type**) shows that brunettes are better protected than blonds from the harmful effects of light, yet even in the albino the macula has more protective pigment than other regions of the retina. Hence he suggests that one function of the visual purple is to protect the nerve layers from undue light. He shows from the description of the fundi of many animals that the amount of pigment and the presence of other structures designed to protect the eye from light vary with their habits especially whether diurnal or nocturnal and the conditions under which they live. Possibly some of the diseases whose etiology is unknown, such as vernal catarrh, depend upon the action of light. As glass excludes ultra-violet rays he finds a possible therapeutic agency in them.

Alling.

According to Schanz and Stockhausen (12, **The action of the ultra-violet rays upon the eye**), the ultra-violet rays cause a fluorescence of the lens, not through a change of these rays into rays of different wave lengths within the visible spectrum, but through the becoming visible of ultra-violet rays of from 400 to 350*mm* wave lengths. Among the pathologic effects of the ultra-violet rays, erythropsis is important, while scotomata of red and green in the neighborhood of the point of fixation and disturbances in the lens have been observed. The ultra-violet rays also cause external troubles of the eye, most marked in the form of the electric ophthalmia.

According to Best (13, **Injuries of the eye by luminous and ultra-violet rays**), erythropsia after snow-blindness is the consequence of the dazzling with the luminous rays, as well as

are the enfeeblement of the perception of green and red after dazzling and the destruction of the retina by direct sunlight. One can look at the sun for ten seconds through a uviol glass of 3*mm* strength without injury to the eye, although all the ultra-violet rays act upon the retina during that time. The ultra-violet rays under 400*mm* are under the ordinary conditions of life of no importance to the retina, while the luminous rays in excess can injure it. The possibility that the momentary concentrated action of the ultra-violet rays may produce cataract is no evidence in favor of the chronic injury produced by these rays which is assumed by some authors. The quantity of ultra-violet rays in modern sources of light is insignificant. Troubles caused by work in bright artificial light are due to bad arrangement. The best protective glasses for the eyes are the gray and blue hitherto used.

According to BIRCH-HIRSCHFELD (14, **The injury of the eye by light and its prevention**), electric ophthalmia is to be ascribed with certainty to the effect of short-waved light, while the luminous rays scarcely come into consideration. Retinal troubles may be caused by short-waved light, but here the luminous rays must be considered. Protective spectacles of epixanthos glass, Hallauer's glass, or euphos glass are recommended.

The curative effect of the products of inflammation depends, according to ZUR NEDDEN (15, **The natural curative factors of infectious eye diseases**), upon the fact that the bactericides of the blood enter into them. The pathogenic bacteria not only cause an injury to the tissues, but also promote the healing, as they entice materials from the organism which destroy them. In addition to these bactericide substances of the blood, there is a material called leucin in the leucocytes which kills bacteria. The opsonin of the normal serum also enters into the products of inflammation of the eye. Its action is of value after the bacteria have already been injured by the bactericide substances. The importance of phagocytosis in the healing process has been greatly overestimated. The best treatment of infectious processes is that which increases the natural healing power; hence the influencing of the body is much more important than the direct destruction of the

exciters of the disease. Therefore antiseptics are of little use because they do not penetrate deeply into the tissue to the seat of the true exciter of the disease. Astringents, on the contrary, exert an intensive stimulation which brings about an accumulation of the natural curative factors at the place of inflammation in the deeper layers of the tissue. In the same way as antiseptics, all other locally applied bactericide remedies, such as pyacyanosis, gall, and fresh human or animal serum, produce only a superficial effect. The introduction of iodoform into the eye in intraocular infections produces no disinfection. The active curative factor in this case is the opening of the eyeball, for it produces a strong hyperæmia of the uvea which introduces bacteriolysin and opsonin into the aqueous and cornea. Paracentesis of the anterior chamber is therefore the most efficient treatment of infectious processes in the anterior segment of the globe. Likewise the subconjunctival injections of fluids which cause stimulation favor the transition of the curative factors into the anterior chamber and cornea, while the vitreous is not influenced to any great degree. The antiseptics accomplish in this way no more than other means. The results of light therapy likewise rest not on the bactericide action, but on the influence exerted on the tissues by the chemically acting rays. The application of warmth favors the accumulation of the curative substances in the focus of infection. All methods of immunization are nothing else than a strengthening of the natural curative factors. Aside from immunization, everything that contributes to strengthen the organism, such as treatment with arsenic, iodin, and sod. salicylate, strengthens the natural curative factors. Such remedies do not directly kill the pathogenic organisms; on the contrary, in the minimal dose they produce tissue changes, especially in the case of arsenic.

According to TSCHIRKOWSKY (16, **Experimental observations concerning the action of an infection produced by non-pathogenic microbes of the conjunctiva in an eye that has been operated on**), the introduction of large quantities of saprophytic staphylococci into the anterior chamber after the lens has been extracted results in panophthalmitis, while the same dose in a normal eye excites only a slight iritis

which recovers, leaving no trace. According to Andogski, an infection of the anterior chamber with small or moderate doses of staphylococci resulted after the same operation in an iritis which partially or completely occluded the pupil. After iridectomy, an infection with small or moderate doses of staphylococci resulted only in a very transient iritis. After discission of the lens, the introduction of staphylococci into the anterior chamber caused no suppuration. The introduction of small or medium doses of saprophytic staphylococci into an aphakic eye with intact posterior capsule caused a moderate iritis. An infection with the same dose after discission of the capsule caused in some cases a panophthalmitis, but in most of the cases a severe iritis which resulted in occlusion of the pupil.

Chromatopsia may result from external injuries and operations according to HILBERT (17, **Pathological color sensations in consequence of surgical diseases**). Erythropsia has been observed after a loss of epithelium of the cornea, after a laparotomy, and after contusion of the lids and detachment of the retina; xanthopia after a shot wound, after enucleation, after sunstroke, after exposure to a strong electric light in the course of an otitis media, and after snake-bite; kyanopia (blue vision) after an operation for glaucoma, after a galvanocautery of the nose, after scalding of the breast and hands, and in arteriosclerosis and apoplectic seizures; chloropia (green vision) after a wound of the cornea, injury of the eye by a fragment of metal, after a cataract extraction, and after prolonged exposure of the head to the direct rays of the sun; janthinopia (violet vision) in suppurative otitis media and retinal detachment.

Any unilateral headache not of the migraine type, but of neuralgic nature, and particularly if it is localized, is suggestive of inflammation of the accessory sinuses, according to SYNDACKER (18, **Differential diagnosis between headaches due to ocular defects and those caused by inflammations of the accessory sinuses**). The frontal and orbital surfaces of the frontal sinus should be tested. Headaches which are ascribed to an attack of grip, or to a bad cold, may be due to an inflammation of the accessory sinuses, as well as a sudden severe headache with a feeling of pulsation, or a periodic headache

which begins after recovery. Any flow of pus from the nose is to be considered, particularly if it is on one side alone.

LOEHLEIN (19, **The action of gallic acid salts upon gonococci and conjunctival secretions containing gonococci**) shows that sodium tauro-cholate in a 2% solution has a moderate, in a 5% solution a powerful, bactericide effect upon gonococci. The bactericide power of sodium glycocholate is still greater. Experiments on men showed that 2–3% solutions are well borne, but 5% solutions are painful and cause a hyperæmia of the conjunctiva that lasts about an hour with no chemosis. The secretion enveloping the gonococci delayed the destruction of the latter by the gallic acid salts, but did not prevent it. He recommends in gonorrhœal ophthalmia thorough cleansing of the eye with irrigations of boric acid solution and the instillation of a 2 or 3% solution of sodium glycocholate every three hours.

One of the tumors described by ALT (20, **Some interesting tumors**) showed small bands of elongated cells with rod-like nuclei resembling smooth muscle fibres. The bands which lay parallel to each other in piles were, especially at the periphery, surrounded by sarcoma cells. The tumor was diagnosed as a malignant leio-myo-sarcoma. Similar tumors have been described coming from the stomach, intestine, and uterus, but are rare. It may have arisen from Müller's muscle or from the muscular coats of the arteries.

ALLING.

HARRINGTON and BALLANTYNE (21, **Remarks on the use of Calmette's ophthalmo-reaction for tuberculosis**). The paper professes to be an unprejudiced record of the results obtained by the authors in an exhaustive trial of the tuberculin test of Calmette–Wolfe–Eisner. The preparations used were those supplied to the profession by the wholesale chemists. Fifty-two cases were tested with 0.25%; 52 with 0.5%; and 35 with 1% solutions. The ages of the patients varied from 10 months to 66 years. Each was carefully examined for clinical evidence of tubercle. Only a single drop of the reagent was instilled. Sixteen cases were clinically tuberculous; 123 cases clinically non-tuberculous. In 8 cases a post-mortem examination was made. 75% only of the clinically tuberculous gave a positive result = 75%. 39 of

the clinically non-tuberculous gave a positive reaction = 31.7%. Of these, the 0.25% solution reacted in 27%, the 5% solution in 29.8%, and the 1% solution in 41.3 of the cases. The 1% solution of one firm seemed to be inert, giving no reaction in 14 non-tuberculous and 1 tuberculous subject, whereas another preparation gave 80% positive results in both tuberculous and non-tuberculous. The authors found that the reaction generally lasted 5 or 6 days, but the eyes were sometimes inflamed for two months! The average time was ten days. No eye was permanently damaged. The authors find that the test is neither safe nor reliable, and cannot be recommended for universal application.

T. HARRISON BUTLER.

RANDOLPH (22, **A case of Mikulicz's disease**). This disease is a symmetrical enlargement of the lachrymal and salivary glands. The etiology and pathology are obscure. Randolph's case was a negro woman who had marked enlargement of the lachrymal glands, but with no inflammatory signs. In three months the swelling had disappeared, but the parotids then became involved in the same way. Potassium iodide was given, but there was no history of lues.

ALLING.

STANCULEANO (23, **Contribution to the experimental study of corneal tuberculosis**) obtained the following results from his experiments. The injection of tuberculous material of human origin, or of an attenuated culture of tubercle bacilli into the cornea of a rabbit caused, after a period of incubation, infiltration, ulceration, and destruction of the cornea without extension of the tuberculosis to the inner membranes of the eye. The injection of tubercle bacilli obtained from cattle into the cornea of rabbits and dogs caused punctate or linear infiltrates which healed spontaneously and left behind no traces. The experimental keratitis produced by injection of the bacillus tuberculosus of Timothee differentiates itself from that produced by tubercle bacilli by its benign course and the tendency to resorption.

BERGER.

GRIMSDALE (24, **The treatment of septic conditions of the eye by means of vaccines**). In the first case on the sixth day after a cataract extraction septic iritis set in of a severe type.

An emulsion of 100,000,000 staphylococci were injected at once, and the inflammation became stationary. The staphylococcal opsonic index was found to be lowered. Six further doses of the emulsion were administered by the mouth and eventually the eye became quiet. The after-cataract was divided with a knife and an acuteness of $\frac{5}{6}$ obtained.

The second case was an acute inflammation in an eye whose retina was known to be detached. The probable cause was an abscess in the mouth. After three doses of emulsion of staphylococci the eye quieted down.

T. HARRISON BUTLER.

GRADLE (25, **Staphylococcus vaccination in phlyctenular disease**) believes that while all phlyctenular conditions are associated with tuberculous lymph glands they are not in themselves tuberculous lesions. Axenfeld and Bach found the contents of phlyctenules generally sterile but occasionally invaded by staphylococcus. The author found that in nine cases of relapsing phlyctenules the use of the staphylococcus vaccination brought about no sudden change but a continuous improvement more rapid than when only local treatment was used. He also describes a case of superficial keratitis with pannus due to repeated phlyctenules which had resisted local treatment but cleared up under the serum.

ALLING.

CORBUS and HARRIS (26, **The diagnosis of syphilitic eye lesions by means of the spirochæta pallida and the serum reaction of Wassermann**) describe the Wassermann serum test, giving their own and the experience of others that it is positive in nearly all cases of syphilitic lesions of the eye as well as those of other parts.

ALLING.

PADERSTEIN (27, **Optic atrophy from atoxyl and arsacetin**) reports the case of a man 62 years of age who was given injections of atoxyl, beginning with 0.1, finally 0.6 gr. daily, because of a substernal tumor. At the end of two months, visual disturbances appeared, the retinal arteries were small, the visual field much contracted, the vision reduced to $\frac{1}{3}$. The contraction of the field continued to increase and the optic nerve became pale. A second case was one of a woman 67 years old who was given injections of atoxyl for 37 days

because of pernicious anæmia. The largest single dose was 0.2 gr. Four months later she suddenly became totally blind. She likewise had optic atrophy.

According to IGERSHEIMER (28 and 29, **Atoxyl poisoning, with special reference to its action on the eye; The effect of atoxyl upon the eye**), in the great majority of cases atoxyl amblyopia is due to simple progressive optic atrophy. The only autopsy yet performed showed the greatest changes of the optic fibres to be in the neighborhood of the chiasm; these changes were purely parenchymatous. Experiments with the local application of atoxyl to the eyes of rabbits show that after the injection of small and medium quantities either into the vitreous or under the conjunctiva the nervous substance alone degenerated. In dogs and cats, subcutaneous introduction of atoxyl was followed by degeneration in the inner layers of the retina and in the optic nerve. In cats, intensive nervous symptoms followed the application of atoxyl, and anatomical examination revealed serious cell changes in the brain, especially localized in the optic thalamus. Atoxyl amblyopia in man has an entirely different course from the amblyopia of arsenic and anilin. It can be demonstrated chemically that most of the injected atoxyl circulates unchanged in the blood and is excreted, but that small quantities of inorganic arsenic are broken off from the atoxyl molecule. Chemical studies show that there is a marked affinity to the atoxyl molecule in the eyeball, but not to the inorganic arsenic. A dependence of the changes in the eye upon diseases of the internal organs does not exist.

The amblyopia that follows large doses of quinine is to be ascribed to a great contraction of the blood-vessels induced by a toxic action of the alkaloid, according to BEHSE (30, **Experimental studies concerning the effect of quinine upon the eye**). This contraction may or may not cause injury of the vessel walls. If the walls are uninjured, the contraction gives way after a time and results in little or no injury to the vision, but the result is otherwise if the walls are injured. The lesion may affect only the endothelium, or it may involve the muscularis, or even the adventitia, in which case the internal elastic membrane is burst and may roll in between the red blood corpuscles. As the blood current is slowed at

the junction of the central artery by the angular bend and the contraction of the vessel, favorable conditions are furnished for the formation of a thrombus, which is consequently formed, and the serious symptoms of such an affection follow.

In SAUVINEAU'S (31, **Iodoform amblyopia**) case visual disturbance and headache followed the use of an iodoform dressing; central scotoma and a slight optic neuritis were present in each eye. Complete recovery took place under the influence of potassic iodide and inunctions of mercury.

BERGER.

According to RUPERT (32, **The influence of adrenalin upon the intraocular tension**), instillations of 4 or 5 drops of a 1 to 1000 solution of adrenalin, or subconjunctival injections of a smaller quantity, induce at first a reduction, but later an increase of the intraocular tension. In eyes with normal tension, the effect persists a few hours; in glaucomatous eyes, several days. In some cases of glaucoma the effect of the adrenalin is principally to decrease the tension, in others to increase it. Repeated instillations do not notably influence the normal tension. The fluctuations in tension met with after the simultaneous instillation of adrenalin and eserin are the result of two different forces acting simultaneously. In patients with glaucoma, or predisposed thereto, the use of adrenalin, even in conjunction with eserin, requires care. The fluctuations of the intraocular tension caused by adrenalin are best explained by the action of the drug upon the vascular system of the eye.

HAPPE (33, **Experimental studies of non-specific serum therapy**) says that the favorable effect that is ascribed by Deutschmann to his serum in experimental eye affections is not demonstrated with exact technic, and that therefore this method of treatment lacks the experimental basis.

THOENESSEN (34, **Treatment of eye diseases with Deutschmann's serum**) reports 13 cases of corneal ulcer in which Deutschmann's serum was used. The result was good in only two cases, in 8 others a slight improvement was obtained with the help of other measures, and in 3 it failed completely.

The protective bodies of the blood serum can be brought into the anterior chamber as well by subconjunctival injections of air as by those of salt, according to MIJASCHITA (35,

Experimental studies concerning the action of subconjunctival injections of air). The quantity of the air injected may vary from 2 to 6*ccm*, but the injections must be made carefully and slowly, as an air embolus may easily be produced.

WEBSTER FOX (36, **Mules' operation**) describes how he performs Mules' operation. A gold ball is introduced into the scleral cavity which has been eviscerated, the muscles being all previously tenotomized. A glass "conformer" is inserted under the lids. A firm bandage is maintained for 48 hours. Iced compresses made with acetate of lead, opium, belladonna, arnica, and camphor are then used. Fox has never had a case of sympathetic ophthalmitis in 585 operations. It must, however, be stated that since Fox published his paper several cases of this terrible complication have been published, chiefly in American journals Fox describes how he introduces a gold ball into an orbit whose eye has already been enucleated. A lateral incision is made in the conjunctiva and deeper tissues and a gold ball introduced with a scoop. The results are said to be perfect. T. HARRISON BUTLER.

LOEB (37, **Hereditary blindness and its prevention**) has taken great pains to obtain from the profession an expression of opinion regarding the advisability of marriage among the blind, whereas a reasonable position seems to be that which prohibits, so far as practicable, such alliances when the blindness is known to be capable of transmission, and in case of non-hereditary forms to regard the question as purely sociological, and beyond our province.

ALLING.

DILLER'S (38, **Hysterical blindness**) case gave a history of sudden blindness and after sudden paralysis of right arm and loss of stereognostic sense in that member. There was also tubular contraction of the field of vision.

ALLING.

The interesting feature in the case of FRYER and LICHTENBERG (39, **A case of amaurotic family idiocy**), which was a child of twenty-one months, is the absence of the characteristic macular changes, although other signs of the disease were present, such as progressive loss of mentality, flaccid muscles, optic-nerve atrophy, etc. The case was probably well advanced. ALLING.

III.—INSTRUMENTS AND REMEDIES

40. PEREKUPOW, A. J. **Lipogenin solutions for the treatment of eye diseases.** *Russk. Wratsch*, 1909, No. 17.

41. LYSTADT, H. **Argyrol and argyrie.** *Tidskrift f. d. Norske Loegeforen*, 1909, p. 685.

42. CHENEY, F. E. **The newer silver salts as compared with silver nitrate in the treatment of ophthalmia neonatorum.** *Boston Medical and Surgical Journal*, March 4, 1909.

43. WOLFRUM and CORDS. **The use of the scarlet red ointment in affections of the eye.** *Muenchener med. Wochenschrift*, 1909, p. 242.

44. MACNAB, ANGUS. **A new retinoscope.** *Ophthalmoscope*, Feb., 1909.

45. SUTCLIFFE, J. H. **The optical principles of the keratometer.** *Ophthalmoscope*, Apr., 1909.

PEREKUPOW (40, **Lipogenin solutions for the treatment of eye diseases**) comes to the following conclusions: (1) Pure alkaloids are more soluble in lipogenin than in olive oil. (2) Solutions in lipogenin are more permanent than those in oil or water. (3) The solutions do not need to be sterilized, because chemically pure lipogenin has already been sterilized by heat in its preparation. (4) Lipogenin solutions are sterile and are bad nutriment for bacilli. (5) They do not irritate the eye. (6) The effect of the alkaloid is obtained quicker than with an equally strong solution in oil or water. (7) The duration of the effect is the same as that of solutions in oil. (8) The cost is the same as that of solutions in oil, and slightly higher than that of solutions in water. (9) The precipitates which appear in lipogenin solutions dissolve again on heating, while the solution maintains its efficiency. (10) Lipogenin remains, like oil, long on the lids, lashes, and skin of the face, which is a disadvantage.

HIRSCHMANN.

LYSTAD (41, **Argyrol and argyria**) has seen argyria caused four times by the instillation of a 10% solution of argyrol once or twice daily for from four to six months.

HELLGREN.

CHENEY (42, **The newer silver salts as compared with silver nitrate in the treatment of ophthalmia neonatorum**) believes that laboratory experiments should be checked by clinical observations, and states his faith in argyrol and protargol in spite of the adverse laboratory reports. He advocates these

salts also in the routine treatment of the new-born as a preventive measure, in place of the usual silver nitrate, as being safer in the hands of the average practitioner.

ALLING.

In the treatment of corneal injuries and ulcers with a 5% ointment of scarlet red, WOLFRUM and CORDS (43, **The use of the scarlet red ointment in affections of the eye**) received the impression that the epithelium develops over the defects more quickly than in other methods of treatment.

MACNAB (44, **A new retinoscope**). This is designed to produce a convergent band intensified and sharp as regards its shadow edge but plane in movement. The band can be made to lie in the axis of astigmatism by rotation. A scale indicates the axis of the meridian. The mirror is amber colored, projecting monochromatic light, improving the definition of the shadow edge. The note does not explain how these desirable features are obtained. We have tried the instrument and have found it very satisfactory.

T. HARRISON BUTLER.

SUTCLIFFE (45, **The keratometer**). This paper gives an excellent account of the principles of ophthalmometers in general and a detailed clear explanation of Sutcliffe's instrument, which is now acknowledged to be the best of them all. The paper is profusely illustrated and should be read by anyone intending to buy an ophthalmometer.

T. HARRISON BUTLER.

Sections IV.–VII. Reviewed by DR. ABELSDORFF, Berlin.

IV.—ANATOMY.

46. SHOEMAKER, W. T. **Optico-ciliary vessels. Report of a case.** *Annals of Ophthalmology*, Apr., 1909.

47. RICHTER, H. **The muscles of the iris in the sheep and their relation to the form of the pupil.** *Arch. f. Ophth.*, lxx., No. 3, p. 407.

48. SEEFELDER, R. **The development of the retinal vessels in man.** *Arch. f. Ophthalmologie*, lxx., No. 3, p. 448.

49. SEEFELDER. **The beginning of the fovea centralis retinæ in man.** *Fortschritte der Medicin*, 1909, No. 13, p. 481.

50. DE VRIES, W. M. **The rudiment of the eye in cyclopic malformations.** *Nederl. Tydschr. voor Geneesk.*, i., No. 17, 1909.

SHOEMAKER (46, **Optico-ciliary vessels**) noted a vein running from the inferior papillary vein near the centre of the disk outward and downward to the margin where it abruptly disappeared beneath the retina into the choroid. Ten such cases of similar anomalies have been reported. He believes his case to be an erratic choroidal vessel, and a form of choroido-vaginal vein, which have also been described as passing through the choroid toward the disk and disappearing at the disk margin. ALLING.

RICHTER (47, **The muscles of the iris in the sheep and their relation to the form of the pupil**) distinguishes in the iris of the sheep the central from the peripheral part, to the inner surface of which the ciliary processes extend. This peripheral zone takes no part in the play of the pupil; its dorsal and ventral breadth is very small, because the ciliary processes extend farther toward the centre nasally and temporally than dorsally and ventrally. The miotic slit of the pupil is changed in mydriasis into an oval or circular opening. Miosis is the state of rest of the iris. The dilatator is strongest in the dorsal and ventral quadrants, where the iris makes the greatest movement in the play of the pupil. On the temporal and nasal sides, radial muscle bands extend from the cells of the dilatator lamellæ into the stroma of the iris where they join with the fibres of the sphincter. These lateral muscle bands support the stroma and prevent its being drawn toward the centre when the sphincter is contracted temporally and nasally. This results in an oval pupil.

According to SEEFELDER (48, **The development of the retinal vessels in man**), the first signs of the system of retinal vessels can be demonstrated at the beginning of the fourth month. The retinal arteries are at first branches of the hyaloid artery. Before the appearance of the arterial vessel buds, a primitive system of veins is present in the axis of the optic nerve and about the papilla, to which the new retinal vessels join themselves. There is no membrana vasculosa retinæ in man, the newly formed retinal vessels bury themselves immediately in the layer of nerve fibres of the retina. As there is no connection between the development of the retinal vessels and that of the ciliary or choroidal vascular system, at no time does a development of a cilio-retinal system

of vessels exist, and therefore when such vessels are present in the adult eye the condition is one of an abnormal formation rather than of an abnormal persistence of a normal embryonal condition. The development of the retinal vessels is completed in the eighth fœtal month.

According to SEEFELDER (49, **The beginning of the fovea centralis retinæ in man**), the first signs of a fovea centralis can be demonstrated toward the end of the sixth fœtal month. At this time there are no signs of a development of cones at the fovea, although between the fovea and the papilla there is a development of both rods and cones. The development of cones first extends to the fovea in the eighth month. In the eye of the new-born child, the cones are still short, plump formations with just the first perceptible signs of an outer limb. During the first weeks of life, the cones of the fovea are of the same thickness as those in the neighborhood, and then gradually attain the height and thickness which characterize those of the complete fovea.

DE VRIES (50, **The rudiment of the eye in cyclopic malformations**) investigated three cases of cyclopia and found that the malformation took place in two, in which the rudiments of both eyes were present, before the formation of the secondary optic vesicle; and in the third, in which there was a single rudiment, before the formation of the primary optic vesicle.

B. P. VISSER.

V.—PHYSIOLOGY.

51. HARRISON, P. W. **An effort to determine the sensory path from the ocular muscles.** *Bulletin Johns Hopkins Hospital*, Apr., 1909.

52. STARGARDT, K. **Catadioptric associated images in the eye.** *Arch. f. Ophthalmologie*, lxix., No. 3, p. 563.

53. EDRIDGE GREEN, F. W. **The perception of light and of color.** *Berliner klin. Wochenschrift*, 1909, No. 1, p. 12.

54. HERING, E. **A method for the observation and estimation of the time of the first after-image of a small moved object.** *Arch. f. d. ges. Physiologie*, No. 126, p. 604.

55. DITTLER, R., and EISENMEIER, J. **The first positive after-image after brief stimulation of the eye by a moved source of light.** *Ibid.*, p. 610.

56. SCHIRMER, O. **The influence of the sympathetic upon the function of the lachrymal gland.** *Ibid.*, p. 351.

57. Revesz, G. **The critical gray.** *Zeitschr. f. Sinnesphysiologie*, No. 43, p. 345.
58. Tosaku Kinoshita. **The negative after-images.** *Ibid.*, p. 420.
59. Wanach, A. **Color weariness.** *Ibid.*, p. 443.

Harrison (51, **An effort to determine the sensory path from the ocular muscles**) in his experiments failed to obtain any loss of ocular muscle balance following division of the trigeminus, nor did he find any degeneration in what are supposed to be the musculo-sensory organs of the ocular muscles, which tends to show that the trigeminus nerves at least do not convey sensory impulses for these muscles as would be inferred from clinical observations. Alling.

Stargardt (52, **Catadioptric associated images in the eye**) has studied the catadioptric associated image which is produced close in front of the retina through reflection from the posterior surface of the lens and reflection from the posterior surface of the cornea. He finds that the dioptric image in the eye is 1,140,000 times brighter than the simultaneously produced catadioptric image. If the position of the catadioptric image is determined by projection upon the arc of a perimeter, it is found to vary markedly as the light source is to the right or the left of the zero point. This variation in position corresponds to the decentration of the eye, which is thus also demonstrated entoptically.

According to Edridge Green's (53, **The perception of light and of color**) hypothesis, light frees the visual purple from the rods, which then spreads into the fovea centralis and the other parts of the retina. The retinal cones are insensitive to light, but sensitive to the chemical changes in the visual purple. In the retinæ of two monkeys that had been kept in the dark for forty-eight hours, the yellow spot was the reddest part of the entire retina, and the visual purple could be seen between, but not in the cones. He supposes a development of the color sense: all objects appear colorless at first, then red and violet are seen (dichromasia), later green is added (trochromasia), and so on.

Hering's (54, **A method for the observation and estimation of the time of the first after-image of a small moved object**) method of time estimation of the positive after-images of moved objects is as follows: he takes two objects exactly

alike and arranges them one after the other so that the primary image of the second object appears in the same place and time as the positive after-image of the first object. Then three images will be visible: the primary image of the first object, the primary image of the second object at the place of the positive after-image following the first primary image, and the positive after-image following the second primary image. The three images are equidistant from each other and the easily measured interval of time between the two primary images is the interval between a primary image and its first positive after-image. The experiment may be improvised easily with two needles stuck in a cork, which may be moved in front of a white background The value of this method exists not only in the possibility of exact measurement of the interval of time, but also in the fact that it shows more clearly the nature of the positive after-image which first follows the movement of a small object in an eye adapted to the light than the use of a single object.

DITTLER and EISENMEIER (55, **The first positive after-image after brief stimulation of the eye by a moved source of light**) observed in stimulation of the retina with a moved, luminous slit a hitherto undescribed positive after-image before the so-called Purkinje's image, which is separated from the primary image by a dark interval. Although this after-image is most distinct in light adaptation it can still be seen with the dark adapted eye. If the light is colored by a gelatine plate, the after-image presents the same color with the same distinctness, in which it differs from Purkinje's image. There is no difference between the foveal and the extrafoveal appearance. The interval of time between the appearance of the primary image and the first positive after-image averages 0.04 second. An increase of the intensity of the light hastens the appearance of the first positive after-image. A lengthening of the slit, *i.e.*, an increase of the places on the retina simultaneously stimulated, without change in the duration of the irradiation, acts in the same way. In the fovea centralis the appearance of the first positive after-image is distinctly slower than in the paracentral and peripheral parts of the retina. These conditions are not influenced by the quality of the stimulating light.

SCHIRMER (56, **The influence of the sympathetic upon the function of the lachrymal gland**) has studied the question whether the sympathetic contains secretion fibres for the lymphatic gland in patients with old and with fresh paralysis of the sympathetic, and has also electrically stimulated the peripheral stump after section of the sympathetic in man. He finds: (1) stimulation with the induction current of the peripheral stump of the sympathetic does not produce an increased secretion of tears; (2) in old paralysis of the sympathetic the secretion of tears is not changed either quantitatively or qualitatively; (3) in fresh paralysis of the sympathetic the quantity of tears is regularly more or less diminished for some weeks or months without change in the quantity of dry constituents. The apparent contradiction between one and three finds an analogy in the fact that stimulation of the sympathetic calls forth no secretion from the parotid, although the sympathetic conducts the exciting nerves of the salivary glands. Two and three are just as little contradictory, because the different symptoms of paralysis of the sympathetic may retrogress. If the sympathetic acts upon the gland entirely through the vessels, a fresh paralysis of the sympathetic with consecutive hyperæmia of the gland could not cause a diminution of secretion. Hence it is necessary to ascribe to the sympathetic true secretion fibres, if it is not also able to call forth the secretion of tears without the facialis.

REVESZ (57, **The critical gray**) designates as the critical gray that in which the total intensities of the white and black stimulations are at their minimal. Color reaches its maximal capacity when the psychic equivalent of its achromatic components is the critical gray.

KINOSHITA (58, **The negative after-images**) produced the after-images in two ways: (1) in the usual way, by moving the object while the eye remains fixed; (2) by bowing the head while the object is fixed. After-images may be obtained in both ways, but generally those obtained with a moved object and a quiet eye are of greater distinctness and duration than the others. Movements of the external eye muscles, as well as changes in the position of the head, act injuriously on the phenomenon. Kinoshita thinks that the greater diffi-

culty in keeping the bowing line of fixation than the resting plays a part in the difference in the distinctness of the after-images obtained by the two methods.

WANACH (59, **Color weariness**) states that if one looks through a hole *2mm* large in a black screen held close in front of the eye at the milk-glass globe of a burning light while the other eye is closed the light immediately appears much more reddish. From other experiments he draws the conclusion that the less refractive rays weary the eye more quickly than the more refractive.

VI.—REFRACTION AND ACCOMMODATION.

60. STRAUB, M. **Etiology of the refractive anomalies of the eye and the origin of emmetropia.** *Arch. f. Ophthalmologie*, lxx., No. 1, p. 130.

61. DUANE, A. **The accommodation and Donders's curve and the need of revising our ideas regarding them. An experimental study.** *Jour. Amer. Med. Assoc.*, June 19, 1909.

62. EATON, F. B. **Practical relation between refraction, accommodation, age, and occupation.** *Ophthalmology*, Apr., 1909.

63. HOEPNER. **Final results in the cases of myopia operated on in the Universitaets-Augenklinik at Leipsic between Nov. 1, 1893, and Apr. 30, 1906, with special reference to postoperative retinal detachment.** *Arch. f. Ophthalmologie*, lxx., No. 1, p. 1.

64. SHINTARO IMAI. **The result of the operation for myopia.** *Beitraege z. Augenheilkunde*, No. 72.

65. VOSSIUS, A. **The result of the operation for myopia** *Berliner klin. Wochenschrift*, 1909, No. 26, p. 1197.

66. HENDERSON, F. L. **Postdiphtheritic paralysis of the accommodation.** *American Journal of Ophthalmology*, Apr., 1909.

67. KNAPP, P. **Transitory hypermetropia in diabetes.** *Zeitschrift f. Augenheilkunde*, xxi., No. 5, p. 420.

68. PELTZER, M. **Irregular absorptions astigmatism.** *Therapeut. Rundschau*, vol. iii., No. 5, p. 67.

69. HARMAN, BISHOP. **The diaphragm test for binocular vision.** *Ophthalmoscope*, June, 1909.

70. ALEXANDER, G. F. **Some properties of the convex lens.** *Ophthalmic Review*, May, 1909.

STRAUB (60, **Etiology of the refractive anomalies of the eye and the origin of emmetropia**) starts with the fact that most eyes become emmetropic during the course of life. The need of clear, distant vision induces dynamic adaptation. The intraocular pressure seeks to level the groove between the

cornea and sclera, flattens the lens, and reduces the refraction, while the tonic contraction of the ciliary muscle opposes the flattening to such a degree that emmetropia is attained. It is shown by his measurements that emmetropic eyes are formed quite differently, that the lenticular radii are relatively greater when the corneal radius is small, and inversely. I. Concerning the causes of myopia, his statistics show that in the schools the frequency of myopia increases with the intensity of study. Yet at the time of their entrance into the school the myopic children of the very poor are two and one-half as many as the myopic children of the well-to-do. In the higher schools, the myopes 18 years old numbered 36% in the gymnasium, 33% in the Handelschule, 24% in the Realschule. But in the last the students enter with a percentage of myopia double that in the other schools. The influence of the schools is also shown in the fact that students of the same age show the more myopia the higher their standing: 18 to 20 % of the younger myopes have corneal opacities; 18% are astigmatic: astigmatism, corneal opacities, and reduced vision from unknown causes form the etiological factor in the majority of the myopes met with in the Poliklinik at Amsterdam, which is visited by the poorest people. As, according to Straub's theory, the greater axial length of myopic eyes is compensated for by flattening of the lens, *i.e.*, by relaxation of the tone of the ciliary muscle, and the ciliary muscle helps to support the tension, he sees in this hypothesis another ground for full correction. II. In hypermetropia, weakness of binocular vision is the factor which exerts an unfavorable influence upon the becoming emmetropic, the functional adaptation of the eye, and the tonus of the ciliary muscle through weak binocular muscular innervation. The weakness of binocular vision likewise explains these three accompanying symptoms of hypermetropia: (1) unilateral amblyopia. One eye does the work, the other can become amblyopic ex anopsia, but can improve if the working eye becomes useless; but so long as this one functionates, the vision of the other can improve only from very energetic exercises. The unequal value of the two eyes is also shown in many hypermetropes in that the hypermetropia is neutralized by accommodation in only one eye. (2) Anisometropia

may depend on unilateral loss of tone of the ciliary muscle, so that under atropin the hypermetropic eye maintains the same refraction while the emmetropic eye becomes hypermetropic. (3) Strabismus. III. In astigmatism the possession of an emmetropic meridian is striven for, as is shown by the great frequency of simple astigmatism. During school life many with hypermetropic astigmatism acquire myopic astigmatism, while mixed astigmatism is rare.

DUANE (61, **The accommodation and Donders's curve and the need of revising our ideas regarding them. An experimental study**) has already published a preliminary report on this subject, but now gives results of examination of about three times as many subjects as Donders utilized. His results differ in that before the age of 20 the range is lower, from 20 to 45 it is higher, and from 45 on it is lower. He claims greater accuracy because all errors of refraction were carefully corrected and better test objects used. He finds, contrary to prevalent opinion, that a true range of 1 D or more exists up to the age of 60. ALLING.

EATON (62, **Practical relation between refraction, accommodation, age, and occupation**) uses a formula $L = d - R + r'$ to determine the lens required for deficiency in accommodation. R represents total range of accommodation, and in hypermetropia and myopia must vary from r which is manifest range; r' is reserve range, which should be about one-third r; d = required distance from the work. At reading distance of thirteen inches $L = \frac{3d - 2r}{3}$. These calculations may be useful if one can agree with his premises. Practically, however, in presbyopia a lens leaving one-third of accommodation in reserve is too strong to be well tolerated.

ALLING.

According to HOEPNER (63, **Final results in the cases of myopia operated on in the Universitaets-Augenklinik at Leipsic**), 242 patients with 338 eyes were operated on for myopia. He gives a tabulated review of them all: a primary discission was performed in 145, in 177 the lens was primarily extracted. After discission there were two cases of infection, two of increased tension, one of acute glaucoma. Detachment of the retina appeared in 11% after discission, in 9.6% after extraction. Though primary extraction affords an almost

certain protection against loss of vitreous, this is not of decisive importance with regard to detachment of the retina, in which individual predisposition plays a great part. 23% of the eyes operated on showed an advance of the myopia. Hoepner recommends in high myopia (over 11 D) extraction of the clear lens with a hollow knife up to the end of the thirtieth year. Healthy eyes should be selected for the operation if possible. In children myopia of 14 D may be operated on when a great progression is to be expected. Retinal hemorrhages, choroidal changes, and vitreous opacities are not affected by the operation. Retinal detachment in one eye contra-indicates the operation in the other, because at least a fifth of high myopes with retinal detachment have a tendency to bilateral detachment. When one eye that has been operated on has remained healthy for one or more years, the other may be operated on in the interest of binocular vision. Sattler gives the following advantages of primary extraction over discission: (1) The smaller number of interventions; (2) the avoidance of increase of tension and loss of vitreous; (3) less danger of a postoperative detachment ofthe retina, the frequency of which can scarcely be increased by the operation.

Shintaro Imai (64, **The result of the operation for myopia**) reports concerning 60 operations for myopia performed on 46 persons at Giessen between 1895 and 1905. 32 patients had only one eye operated on, 14 had both. The majority were between 11 and 30 years of age, the youngest was 7, the oldest 57. The refraction of the great majority was between 15 and 23 D of myopia. The operation consisted of discission with subsequent extraction. The vision was improved in 50 eyes, unchanged in 3, made worse in 7. The last was due to iritis from infection in one case, secondary cataract in two, secondary cataract with retinal hemorrhage in one, and detachment of the retina in three. A longer period of observation increased the number of detachments to 11, 18.3% If three years after the operation is taken as the limit after which a detachment is to be considered spontaneous, only five of these are to be ascribed to the operation. Retinal hemorrhages were observed in 7 cases, the earliest two months after operation. Increase of tension with swelling of the lens occurred five times. Optic atrophy

complicated 4 cases, in 3 with glaucoma, in 1 with retinal detachment. An increase of refraction was not always prevented by the operation; the greatest increase was 4.5 D, the least 1 D, during a period of observation of from 2 to 12 years. The author sums up his results as follows: (1) The operation for myopia affords great advantages to the majority of patients when it is carefully performed and the cases properly chosen. (2) The degree of myopia most suitable for operation is 18 D or more; in myopia of less than 12 D it is not to be recommended. (3) Eyes with extensive choroidal changes should not be operated on. (4) The benefit afforded by the operation consists in an increase of vision. (5) Astigmatism may follow the operation, grow less, and disappear. (6) Discission is to be preferred to primary extraction of the lens. (7) The value and result of the operation can only be ascertained by a later examination after the lapse of several years.

Vossius (65, **The result of the operation for myopia**) up to 1907 has operated on 60 eyes in 46 myopes, 1 eye in 32, both in 14. The refraction was diminished from 12 to 28 D. In 50 eyes the vision was greatly improved immediately after the operation. One eye was lost from infection; the retina became detached in three. The final results were far worse. In 24 cases the good vision had become greatly reduced: in 6 from secondary cataract, in 3 from glaucoma, and in 11, 18.3%, from detachment of the retina. As the majority of the last occurred many years after the operation, only 4, which occurred in from three and one-half to five months after, are to be considered in connection with the operation. In two of these there was a prolapse of vitreous, in one a tag of the capsule was incarcerated in the cicatrix.

Henderson (66, **Postdiphtheritic paralysis of accommodation**), after discussing this subject, concludes that the lesion is in the terminal filaments and is an inflammatory neuritis. The predisposing cause is the excessive supply of toxic blood to the fibres of the ciliary muscle on account of their situation in the vascular ciliary body. The exciting cause may be the difficulty in resting the accommodation which is involuntary, and is likely to be used excessively before strength is fully recovered. Alling.

KNAPP (67, **Transient hypermetropia in diabetes**) observed an acute visual disturbance with manifest hypermetropia in a woman 47 years old and in a man 48 years old, both of whom had diabetes. Under the influence of antidiabetic treatment the hypermetropia retrograded as the sugar disappeared. He thinks the cause of the hypermetropia was a reduction of the refractive power of the lens.

PELTZER (68, **Irregular absorptions astigmatism**) tells of a patient in whom the opacities of an incipient senile cataract for the most part disappeared during applications of iodosolvine to the brow. During 14 days the applications of iodosolvine were discontinued and inunctions of an ointment of potassic iodide substituted, when the opacities in the lens returned to again disappear very quickly when the iodosolvine was reapplied. The absorption of the opacities caused irregular astigmatism, particularly in the right eye, according to the writer. No notes are given with regard to the vision.

HARMAN (69, **The diaphragm test for binocular vision**). The instrument consists of a piece of wood with a handle at the centre underneath. One end fits against the chin, at the other is an object holder. Between the two is a screen with a square hole in the centre. The relative positions of the test object, the screen, and the patient's eyes are such that a man with normal vision gets binocular vision from a narrow median band of the test card and monocular crossed vision from the lateral wings of the card. The test is useful to determine the equality of vision of the two eyes, the condition of binocular vision, to exercise the squinting eye, to detect malingerers feigning monocular blindness. And finally it demonstrates physiological phenomena connected with the perception and suppression of images.

The test is simple and most useful. It is one of the best means for demonstrating binocular vision.

Rémy writes and complains that the test is a copy of his diploscope. T. HARRISON BUTLER.

ALEXANDER (70, **Some properties of the convex lens**). This paper goes deeply into the mathematical properties of the convex lens. Any abstract without the diagrams would be quite unintelligible.

T. HARRISON BUTLER.

VII.—MUSCLES AND NERVES.

71. BJERKE, K. **Strabismus.** *Arch. f. Ophthalm.*, lxix., No. 3, p. 543.

72. VELHAGEN, C. **Cicatrization after tenotomy on the human eye.** *Klin. Monatsbl. f. Augenheilkunde*, xlvii., Supplement, p. 19.

73. LEVINSOHN, G. **A case of loss of light reflex of the right pupil and of convergence reflex of the left.** *Festschrift to Celebrate the 40th Year of Edel's Hospital*, p. 110. Berlin, 1909.

74. LAFON, CH. **The physiology of the pupillary movements.** *Arch. d'ophtalmologie*, xxix., pp. 428 and 490.

BJERKE (71, **Strabismus**) says that he, an emmetrope, learned to produce convergent strabismus, and also voluntarily to call forth a vertical deviation of the eyes, which is much greater in the position of convergence than in that of parallelism. So in the great majority of cases the primary cause of the strabismus is a special innervation, independent of the refraction of the eye. In the operative treatment of squint, Bjerke, after securing the tendon with threads and dividing the insertion of the tendon, brings the axes of the eyes to a position of parallelism and does not finally tie the threads until the patient has looked through the stereoscope and brought the half-images together. In tenotomy, also, he introduces a thread into the muscle to regulate the position of the visual axis. Only in small children and when one eye is amblyopic does he abandon the subjective control of the position of the visual axis during operation.

VELHAGEN (72, **Cicatrization after tenotomy of the human eye**) examined the contents of the orbits on whom a regular tenotomy of the right internus had been performed five years before for convergent strabismus. The tendon insertion had disappeared; the anterior end of the tenotomized muscle had a plump, conical form and was encapsuled at a distance from the sclera in cicatricial tissue, which must be considered as the consequence of the injuries produced by the scissors and strabismus hook. There was no organic reunion of the end of the tendon with the sclera.

LEVINSOHN (73, **A case of loss of light reflex of the right pupil and of convergence reflex of the left**) observed in a patient suffering from tabes loss of the reflex to light in the right pupil, while the left pupil reacted quickly to light, but

showed a very slight and slow reaction to convergence. He considers that this observation confirms his theory that the sphincter nuclei are separate; the sphincter cells affected by light stimulation were injured on the one side, those affected by convergence on the other.

LAFON (74, **The physiology of the pupillary movements**) lays down the following rules for the localization of a lesion of the pupillomotor fibres: (1) Stimulation or interruption of one or both reflex arcs can affect only the pupillary movements normally excited by them; (2) a unilateral or partial stimulation of a centripetal track induces a like disturbance in both eyes; an incomplete interruption of this track causes, on the contrary, no disturbance of the function of the pupillary fibres; (3) the disturbance of a reflex centre induces a bilateral annulment of the pupillary movements excited through the reflex arc involved; (4) interruption or stimulation of a centrifugal track causes disturbance of the pupillary movement only on the side of the lesion; (5) stimulation of the ciliary nerves, or of the ciliary ganglion, induces a maximal contraction, paralysis of the same a maximal dilatation, of the pupil.

Sections VIII.–XII. Reviewed by DR. SCHWEIGGER, Berlin.

VIII.—LIDS.

75. GUTMANN, A. **Two rare diseases of the eyelids.** *Zeitschrift f. Augenheilkunde*, xxi., No. 6, p. 488.

76. BUTLER, T. HARRISON. **Case of recurrent dermatitis of the eyelids relieved by suitable spectacles.** *Ophthalmoscope*, March, 1909.

77. VERWEY, A. **Epicanthus with ptosis and its treatment.** *Nederl. Tydschr. voor Geneesk.*, 1909, i., No. 20.

GUTMANN (75, **Two rare diseases of the eyelids**) finds that the petechiæ of the lids usually met with only in severe general diseases may also occur in slight anæmia when there is a transient stasis in the jugular vein. He also saw in an otherwise healthy man 33 years old several little nodules on both lower lids which were histologically of a tubercle-like structure. Tubercle bacilli could not be found. He believes they were produced by the toxin of the tubercle bacilli and designates

them toxi-tuberculide. They have not previously been observed on the eyelids. As excision of one of the nodules left behind a reddish, dense infiltrated scar, light treatment was instituted.

BUTLER (76, **Recurrent dermatitis of the eyelids relieved by suitable spectacles**). A steel turner, aged 40, began to suffer from a dermatitis of the lids having the following peculiarities: the lids began to itch, got red and hard, and then in two days they began to desquamate, looking like a case of psoriasis. They then became normal for two days, and then the whole cycle recommenced. The condition was repeated several times in spite of treatment. When, however, an excessive correction of hypermetropia was reduced to the correct amount, the dermatitis at once ceased. A photograph shows the eyes in a condition of desquamation.

T. HARRISON BUTLER.

VERWEY (77, **Epicanthus with ptosis**) reports two cases of epicanthus with ptosis. The malformation showed a typical character which agreed in many points with cryptophthalmus. The epicanthus is secondary and the consequence of the vertical tension of the skin. Treatment of the epicanthus with a horizontal incision according to the well known Y–V method produced good results. B. P. VISSER.

IX.—LACHRYMAL APPARATUS.

78. EWING, A. E. **Roentgen ray demonstration of the lachrymal abscess cavity.** *Amer. Jour. of Ophthalmology*, Jan., 1909.

79. MEYER, A. **Nasal causes of diseases of the lachrymal passages of the conjunctiva and their treatment.** *Zeitsch f. Augenheilkunde*, xxi., No. 2, p. 124.

80. BERRY, J. C. **Treatment of obstruction of the lachrymal duct.** *Boston Medical and Surgical Journal*, Apr. 29, 1909.

81. FERGUS, F. **Mr. Percival Pott and the treatment of lachrymal obstruction.** *Ophthalmic Review*, Apr., 1909.

82. WERNCKE, TH. **A hitherto unobserved faulty development of the lachrymal sac.** *Klin. Monatsbl. f. Augenheilkunde*, xlvii., 1, No. 1, p. 83.

To obtain X-ray photographs of these cases EWING (78, **Roentgen ray demonstration of the lachrymal abscess cavity**) injected bismuth in suspension in albolene into the abscess cavities.

MEYER (79, **Nasal causes of diseases of the lachrymal passages of the conjunctiva and their treatment**) divides lachrymal and conjunctival diseases into four groups from a rhinological standpoint: Group I., nose, naso-pharynx, and accessory sinuses perfectly normal; II., deformation or hypertrophy of the inferior turbinate, or diffuse hypertrophic rhinitis, interfering with the flow of tears into the nose; III., inflammatory affections of the nose and adnexæ; here belong dacryocystitis and blennorrhœa and such affections as blepharitis and ulcus serpens which are caused by infection from the nose. Very common causes of lachrymal and conjunctival troubles are ozæna and adenoids; rarer causes are empyemata of the accessory sinuses, polyps, foreign bodies, and nasal calculi; IV., specific infectious processes with involvement of the lachrymal apparatus per continuitatem, such as tuberculosis and rhinoscleroma. The treatment of the first group is purely ophthalmologic, of the second purely nasal, of the third and fourth groups both ocular and rhinological.

BERRY (80, **Treatment of obstruction of the lachrymal duct**) agrees that most cases in infants spontaneously recover, but they occasionally require probing. Membranous closure of the lower end of the canal is to be thought of. He believes that the seton may be made use of to advantage in some cases. In adults he prefers gradual dilatation with the employment of leaden styles between treatments. ALLING.

FERGUS (81, **Percival Pott and the treatment of lachrymal obstruction**) makes Pott's monograph upon lachrymal fistula the text for a most excellent sermon upon the treatment of lachrymal obstruction. May it be read, marked, learned, and inwardly digested, by all junior ophthalmic surgeons. Even to-day in the twentieth century, one constantly sees patients who have been mutilated and tortured by knife and probe with exactly the result which Mr. Percival Pott obtained in 1758. In the latest text-book of Ophthalmology published in Germany, probing is advocated and pages are devoted to explaining to the student how to perform it. Every ophthalmic surgeon is well acquainted with the usual result: after months of agonizing treatment the patient consults another surgeon who excises the sac, and ends the drama. The author advocates lavage with normal saline. It may be neces-

sary to pass a fine probe very delicately, but never to slit up the canaliculus. If this fails the sac must be excised, an operation which, except in tuberculous cases, is usually satisfactory. Epiphora is unusual, but if present the excision of the lachrymal gland cures it. We cannot agree with the author that protargol is inert; a series of careful comparative tests made upon acute ophthalmia in the East has convinced us that it is a most valuable drug, the same tests showing argyrol to be practically inert. B. Cooper has shown that argyrol contains no ionized silver, whereas protargol does. Fergus omits all mention of nasal examination and treatment, which is often very successful.

T. HARRISON BUTLER.

WERNCKE (82, **A hitherto unobserved faulty development of the lachrymal sac**) reports a case in which the right fossa lachrymalis was replaced by a deep opening as large as the tip of the little finger. Canaliculi were not present. From the opening a large canal led into the nose in the direction of the normal lachrymal passage. The man could breathe through this opening when his mouth and nose were closed. Werncke ascribes this congenital malformation to a failure of the lachrymal groove to close.

X.—ORBITS AND ACCESSORY SINUSES.

83. ROY. **Calcified fibroma of the orbit.** *Ophthalmoscope.* Jan., 1909.

84. GUTMANN, A. **Bilateral orbital phlegmon, bilateral thrombosis of the ophthalmic vein and of the cavernous sinus from empyema of the ethmoid.** *Zeitschrift f. Augenheilkunde,* xxi., No. 1, p. 32.

85. KRAUSS, F. **Report of a case of unilateral retrobulbar neuritis due to ethmoiditis with restoration of vision.** *Ophth. Record,* May, 1909.

86. PANOS CHRONIS. **A case of hydatid cyst of the orbit.** *Klin. Monatsbl. f. Augenheilkunde,* xlvii., i., No. 5, p. 513.

87. SYNDACKER, E. F. **Differential diagnosis between headaches due to the eyes and those caused by inflammation of the accessory sinuses.** *Klinische Monatsbl. f. Augenheilkunde,* xlvii., i., No.6, p. 629.

88. HAJEK. **Acute empyema of the ethmoid with great exophthalmos. Endonasal opening. Recovery.** *Zeitschr. f. Laryngologie, u. s. w.,* i., 6, 1909.

ROY (83, **Calcified fibroma of the orbit**) describes a case of this rare disease which has been said by some never to

occur in the orbit. The paper is illustrated by a good photograph. T. HARRISON BUTLER.

In GUTMANN'S (84, **Bilateral orbital phlegmon, bilateral thrombosis of the ophthalmic vein and of the cavernous sinus from empyema of the ethmoid**) case the diagnosis of bilateral thrombosis of the ophthalmic vein and cavernous sinus was confirmed by autopsy. An empyema of the ethmoid had penetrated into the orbit where it had produced a phlegmon, and had also excited a basal septic meningitis. A secondary result was a thrombosis of the ophthalmic vein which had extended into the cavernous sinus and thence through the circular sinus to the other cavernous sinus. Histologically the preparations of one eye showed a thrombosis of the central vein of the retina and also of the central artery; it is very remarkable that in an ascending thrombosis of the orbital veins the central vein, and secondarily the central artery, of the retina should become thrombosed. Cases of unilateral septic thrombosis of the orbital veins and of the cavernous sinus have been described frequently, but only ten cases of bilateral, none of which was due to empyema of the ethmoid.

KNAPP.

KRAUSS (85, **Report of a case of unilateral retrobulbar neuritis due to ethmoiditis with restoration of vision**) observed a case with characteristic central scotoma which was large and absolute. The optic nerve showed no gross changes, but the retina was hazy in the macular region. Draining the ethmoid cells brought immediate relief.

ALLING.

PANOS CHRONIS (86, **A case of hydatid cyst of the orbit**) gives the history of a case of hydatid cyst of the orbit. A transparent fluid was obtained by exploratory puncture which contained NaCl and echinococcus scolices. The cyst was totally removed with its capsule after a broad incision in the lower retrotarsal fold. The microscopic examination revealed that the cyst had started from the inferior rectus. Hydatid cysts do not usually become adherent to the neighboring tissues. This is important in the differential diagnosis from cysticercus cysts, which are apt to excite marked inflammations. The echinococcus is to be differentiated from other tumors of the orbit only by an exploratory puncture.

SYNDACKER (87, **Differential diagnosis between headaches due to the eyes and those caused by inflammation of the accessory sinuses**) has observed that in many cases the headache that brings the patient to the ophthalmologist is due not to disease of the eyes or errors of refraction, but to diseases of the accessory sinuses. The early recognition of these is naturally of great importance, and the following symptoms he considers characteristic of sinusitis. Unilateral neuralgic headache which recurs with a certain regularity and shows a fixed localization is always suspicious, especially when growths or a flow of pus are to be found in the nose. Headaches which come on after an attack of coryza or grippe, or are associated with sensitiveness of the frontal or maxillary cavities, likewise excite suspicion of accessory sinus disease. The X-ray picture is also of importance in doubtful cases of severe headache. He has found the cause of their troubles to be an acute or chronic empyema of the frontal sinus in 7% of the patients who have consulted him because of headaches.

HAJEK (88, **Acute empyema of the ethmoid with great exophthalmos**) describes an exophthalmos after an acute coryza without inflammatory changes in the orbit. After a single large ethmoid cell, which involved almost the entire labyrinth, had been opened the exophthalmos disappeared.

XI.—CONJUNCTIVA.

89. WHARTON. **The frequency and corneal complications of ophthalmia neonatorum.** *Ophthalmoscope*, Jan., 1909.

90. BUCHANAN, LESLIE. **A case of suppurating joint affection following ophthalmia neonatorum.** *Ophthalmoscope*, Feb., 1909.

91. SCHMEGELSKY, N. P. **Relations between follicular diseases of the conjunctiva and those of the pharnyx.** *Westn. Ophthalm.*, 1909, No. 2.

92. MCKEE, S. H. **Another case of meningococcus conjunctivitis.** *Ophthalmic Record*, June, 1909.

93. WOELFFLIN, E., and RUPPRECHT, J. **Histology of Parinaud's conjunctivitis.** *Klin. Monatsbl. f. Augenheilkunde*, xlvii., i., No. 3, p. 247.

94. GREEFF, R. **The ætiology of trachoma.** *Ophthalmoscope*, Sept., 1909.

95. COOVER, D. H. **A new operative procedure in the treatment of trachoma.** *Ophthal. Record*, Feb., 1909.

96. GAGARIN, N. W. **A case of tuberculosis of the conjunctiva.** *Westn. Ophthalm.*, 1909, No. 2.

97. McKee, H. **A mucous patch on the conjunctiva with a demonstration of the spirochæta pallida.** *Ophthalmic Record*, Feb., 1909.

98. Roenne, H. **Nævus conjunctivæ non-pigmentosus.** *Klin. Monatsbl. f. Augenheilkunde*, xlvii., No. 1, p. 384.

99. Roy, J. N. **Voluminous sarcoma of the bulbo-palpebral conjunctiva.** *Ophthalmoscope*, Apr., 1909.

100. Gifford, H. **Treatment of recurrent pterygium.** *Ophthalmic Record*, Jan., 1909.

101. Steinhard, Hans. **A case of subconjunctival cysticercus.** *Medic. Klinik*, 1909, No. 4.

Wharton (89, **Frequency and corneal complications of ophthalmia neonatorum**). There has been much discussion as to whether this disease is becoming less common. Stephenson, in his recent monograph, holds that it is decreasing, but Thomson says that in Glasgow there is no evidence of any improvement. The author has analyzed the cases at the Manchester Eye Hospital for the last 37 years. He finds that the percentage of cases has fallen from a maximum of 5% to less than 1%. The cornea was involved in 17.6% of the cases.

T. Harrison Butler.

Buchanan (90, **Suppurating joint affection following ophthalmia neonatorum**). The eye disease commenced on the tenth day from birth. The gonococcus and a long, thin bacillus were identified in smear preparations. After a month when the eyes were nearly well, the left forefinger and the right great toe were swollen. Pus was evacuated. Then an abscess formed in the palm of the right hand and a knee-joint became inflamed, but did not suppurate. The wounds healed well and the child recovered. Gonococci were found in the pus. The child appeared at one time to be very ill.

T. Harrison Butler.

Among 227 recruits with healthy conjunctivæ Schmegelsky (91, **Relations between follicular diseases of the conjunctiva and those of the pharynx**) found follicular pharyngitis in 103, 45%; of 79 recruits with superficial follicular conjunctivitis 49, 62%, had follicular pharyngitis; of 305 with trachoma 204, 66.4%, had follicular pharyngitis.

McKee (92, **Another case of meningococcus conjunctivitis**) has recently reported six cases of this infection. In the present

instance he found this organism in the conjunctival sac of a girl suffering from cerebro-spinal meningitis.

ALLING.

WOELFFLIN and RUPPRECHT (93, **Histology of Parinaud's conjunctivitis**) found in the subepithelial tissue, which was diffusely infiltrated with round cells, round, tubercle-like formations which contained lymphocytes and mixtures of epithelioid cells. These foci were bounded by a mantle of several layers of plasma cells. No necrotic places were found. The nodules resembled tubercles rather than trachoma follicles; they were differentiated from true tuberculosis by the absence of typical Langhans' giant cells and of caseation. Eosinophile cells, which are abundant in the tissues and secretion in vernal catarrh, were not present in the case examined, a fact of diagnostic importance. Cell necroses in the subconjunctival tissue, heretofore a regular symptom of Parinaud's conjunctivitis, were absent; the authors believe that these first appear after the papillary proliferations have existed a considerable length of time. It is of clinical interest that the case reported recovered completely in six weeks without any real treatment. KNAPP.

GREEFF (94, **The ætiology of trachoma**). Professor GREEFF gave an account of the cell inclusions discovered by himself and independently by Halberstädter and Prowazek. Working with the Giemsa method of staining he has found these granules in all recent cases of trachoma, and has not found them in other conjunctival inflammations. He is inclined to regard them as protozoa; they are certainly not cocci. When the case is brought under treatment these granules disappear. Dr. di Santo working under Greeff's direction has demonstrated the granules in sections of the trachoma follicle. The paper is illustrated by an exceptionally clear plate.

T. HARRISON BUTLER.

COOVER (95, **A new operative procedure in the treatment of trachoma**) scarifies the lid with strips of sand-paper, which he has previously sterilized. He claims for his method that it is applicable to all forms of trachoma, even to smoothing down rough and hypertrophied portions of the conjunctiva in old cicatricial forms. He has never yet seen undue reaction.

ALLING.

GAGARIN (96, **A case of tuberculosis of the conjunctiva**) describes a case in which an abscess resembling a hordeolum at the outer canthus was opened in a boy 12 years old belonging to a tuberculous family, by Salzer. Salzer suspected tuberculosis, but no bacilli were found. Small fringe-like granulations formed at the place of incision. A month later Gagarin found a red nodule in the lateral part of the ocular conjunctiva with a group of little granulations on its surface. In the midst of these there was a very small opening from which a gray, turbid fluid escaped on slight pressure. The tumor was removed and, after repeated examinations, determined to be tuberculous, although no bacilli could be demonstrated. A short time afterward the boy was found to have general tuberculosis. Gagarin considers the tumor to have been a secondarily tuberculous papillomatous conjunctival growth belonging to the fifth group of Eyre.

HIRSCHMANN.

MCKEE'S (97, **A mucous patch on the conjunctiva with a demonstration of the spirochæta pallida**) patient, who was a syphilitic with glandular involvement and masses of mucous patches in the mouth, presented on the conjunctival surface of a swollen under-lid a peculiar pale blue area, sharply contrasting with the reddened conjunctiva. Slides prepared from this patch showed the organism which is the cause of syphilis.

ALLING.

ROENNE (98, **Nævus conjunctivæ non-pigmentosus**) reports two cases of nævus conjunctivæ non-pigmentosus, one of which was progressive, the other stationary. Clinically, each appeared as a bright, reddish or yellowish brown, semi-transparent, sharply defined thickening of the conjunctiva bulbi not over a millimetre thick. The histological examination of pieces excised from each revealed no essential difference in the two forms, but the progressive case seemed to have a greater vitality of the epithelial cells. The progression of this nævus ceased immediately after cauterization along its margin, whether post hoc or propter hoc is uncertain, but Roenne recommends that cauterization should be tried in all similar cases, because extirpation of the nævus is technically difficult and necessitates a plastic operation.

KNAPP.

ROY (99, **Voluminous sarcoma of the bulbo-palpebral conjunctiva**). This report deals with a large, round-celled sarcoma which sprang from the conjunctiva, and had already infiltrated the capsule of Tenon. The eye and the surrounding tissues were freely removed, and after passing through a combined attack of varicella and scarlatina, complicated by acute nephritis and general anasarca, the child made a good recovery. Two excellent photographs are appended.

T. HARRISON BUTLER.

GIFFORD (100, **Treatment of recurrent pterygium**) treats these cases with a large Thiersch flap or epithelial lip flap. The objections to the former are that it always remains epidermal and the epidermis collects on its surface and looks unpleasant, requiring frequent cleansing. The lip flap of mucous membrane remains red and somewhat conspicuous. Occasionally one sees a pterygium which, in spite of repeated excisions recurs in the form of hard, fleshy masses extending over the cornea to the median line. They were formerly supposed to be incurable. ALLING.

STEINHARD (101, **A case of subconjunctival cysticercus**) removed a cyst about 1½*cm* in diameter, freely movable on the sclera, situated in the lower, outer quadrant, from a woman 23 years old. Examination revealed it to be a cysticercus cellulosæ. The case is notable not only on account of the unusual situation and great size, but also on account of the age of the patient, as most conjunctival cysticerci have been met with in ages ranging between 2 and 12 years.

KNAPP.

XII.—CORNEA, SCLERA, ANTERIOR CHAMBER.

102. STEPHENSON, SYDNEY. **Some remarks upon interstitial keratitis with especial reference to pathogenesis and treatment.** *Ophthalmoscope*, Feb., 1909.

103. ISAKOWITZ, J. **Some rare corneal diseases (keratitis marginalis profunda and keratitis aspergillinea).** *Klin. Monatsbl. f. Augenheilkunde*, xlvii., Supplement, 1909, p. 95.

104. DUVERGER. **A rare form of keratitis.** *Soc. d'ophtalm. de Paris*, Dec. 1, 1909.

105. KOMOTO, J. **A case of keratosis of the cornea and conjunctiva with the pathologic condition.** *Klin. Monatsbl. f. Augenheilkunde*, xlvii., p. 259.

106. WEEKERS, L. **Pathology of corneal ulcers due to the Morax-Axenfeld diplobacillus.** *Annales d'oculistique*, cxlii., p. 15.

107. CANTONNET. **Serious corneal ulcer in the course of a cerebro-spinal meningitis. Cure by the instillation of antimeningococcic serum.** *Soc. d'ophtalmologie*, Apr. 6, 1909.

108. MANN, W. A. **Congenital fibroma of the cornea. Report of a case.** *Jour. of Ophthalmology and Otology*, Apr., 1909.

109. OPPENHEIMER, E. H. **Fibroma of the sclera.** *Ophthalmology*, Apr., 1909.

STEPHENSON (102, **Interstitial keratitis**) points out that the disease is not a common one, being found in less than 1% of all patients who come to an eye hospital. The majority of the cases occur between 5 and 15 years, about 80%.

It is due to congenital syphilis in about 70% of all cases, the remainder are the result of tubercle, malaria, influenza, and (in animals) trypanosomiasis. It is always a local manifestation of a general infective disorder. The disease has been produced experimentally in animals by the implantation of syphilitic products, and spirochætæ have been discovered in these artificial cases. Probably the treponema pallida is present in the parenchyma of the cornea in acute syphilitic cases. The disease is not influenced by mercury and iodin. Stephenson has, however, had good results with atoxyl given by injection. At the same time mercury and chalk is given by the mouth. Six cases are described.

T. HARRISON BUTLRE.

ISAKOWITZ (103, **Some rare corneal diseases**) describes first a case of keratitis marginalis profunda met with in a man 47 years of age, the clinical picture of which agreed exactly with the description given by Fuchs. The threatening appearance and the rapid, benign course were marked. The appearance varied remarkably from day to day. Nothing was learned as to its etiology. The second case was one of a peculiar mould fungus disease of the cornea, one of the forms included under the term "mild cases of keratomycosis." In the midst of the fungi was a little insect's wing. The disease healed quickly after removal of the fungi and the foreign body. The fungus was the aspergillus fumigatus. It is noteworthy that a foreign body is always present in mild cases of keratomycosis although not in the severe forms. Moreover in the latter

the seat is always central and the infection of the cornea essentially deeper. KNAPP.

DUVERGER (104, **A rare form of keratitis**) observed in a child 13 years old a severe intraocular hemorrhage with increase of tension. After absorption of the hemorrhage a circular, central opacity appeared in the cornea and then gradually disappeared. In the region of the opacity the cornea was anæsthetic. KNAPP.

KOMOTO (105, **A case of keratosis of the cornea and conjunctiva**) reports an interesting case of keratosis of the cornea and conjunctiva in lichen acuminatus. The conjunctiva was much injected, thickened, and grayish white, especially in the zone of the palpebral fissure. The papillæ were markedly proliferant. The cornea was shining white, especially above and below, thickened, and covered with elevations and depressions. The middle of the zone of the palpebral fissure was clear. Both eyes were affected. After removal of the keratoid surface of the cornea and subsequent treatment with arsenic there was a marked retrogression of all the pathological symptoms. Pathologically this disease consists of keratosis and an intense inflammation of the subepithelial tissue; the proliferation of epithelium and the cornification were everywhere most striking where papillæ were present. Whether the disease of the conjunctiva is primary and that of the cornea secondary or not is uncertain, but the writer thinks such a connection probable. KNAPP.

WEEKERS (106, **Pathology of corneal ulcers due to the Morax-Axenfeld diplobacillus**) had the rare chance to be able to study pathologically a corneal ulcer excited by the Morax-Axenfeld bacillus. Ulcers of this nature are ordinarily benign, and serious cases have been observed but rarely. In this case there was a complete absence of the corneal epithelium in the field of the ulcer, complete absence of Bowman's membrane, and a decrease in the thickness of the substantia propria corneæ which was folded and infiltrated with round cells with numerous polynucleated cells among them. This round-cell infiltration was found at its maximum in two band-shaped places. At these places, where the round-cell infiltration was deepest, Descemet's membrane was absent. The other parts of the eye showed slight changes; the conjunctiva was slightly

infiltrated with round cells, and there were only slight infiltrations of round-cells in the iris and ciliary body. In the stroma of the iris were accumulations of irregular masses of pigment, such as were described by Nuel as found in a case of hypopyon keratitis, but the changes observed by Nuel were much greater than those seen in this case. BERGER.

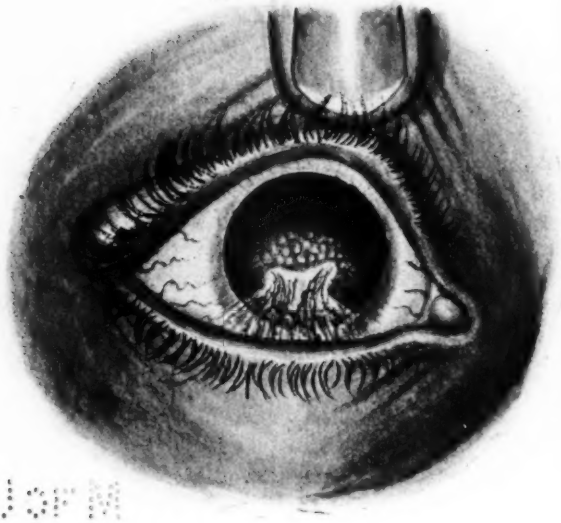
CANTONNET (107, **Serious corneal ulcer in the course of a cerebro-spinal meningitis**) observed in a man suffering from cerebro-spinal meningitis and cured by antimeningococcic serum an ulcer of the cornea which spread rapidly and was cured by local instillation of the antimeningococcic serum into the conjunctival sac. Bacteriologically the presence of the meningococcus in the ulcer could not be demonstrated. BERGER.

MANN (108, **Congenital fibroma of the cornea**) saw a patient 19 years old with a tumor occupying the upper half of the cornea. It was flattened, being about 4*mm* thick and 8*mm* in diameter. It extended from a little above the limbus to just below the horizontal diameter of the cornea. It was pink in color, vascular and had not changed since birth. It was excised. ALLING.

A girl of 14 came to OPPENHEIMER (109, **Fibroma of the sclera**), the right eye slightly lower than the other, but with no apparent limitation of motion although there was diplopia in the lower and upper fields. A small, hard tumor was felt attached to the sclera on the inner side of the inferior rectus, with conjunctiva freely movable over it. In one and a half years the condition had not changed from that after the operation.

ALLING.

TO ILLUSTRATE DR. HOLLOWAY'S ARTICLE ON "THE OCULAR MANIFESTATIONS ASSOCIATED WITH ACNE ROSACEA," ETC.



UofM

Drawn by Margaretta Washington